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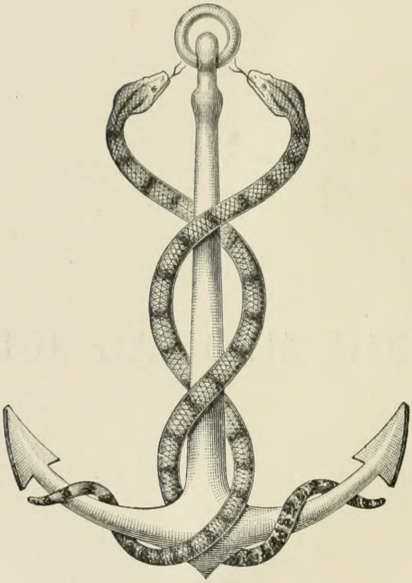

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EDITED BY

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EDITORIAL.

Alcohol and Social Reform.

A CAREFUL study of the conditions surrounding what is called the Drink Question has been made by Dr. Sullivan of the English Prison Service, in which are presented several very acceptable hypotheses for the consideration of the social reformer. Dr. Sullivan's main contention is that it is not the use of alcohol as an intoxicant that is responsible in the main for crime, poverty, and degeneration, but its use as a stimulant by those engaged in industrial occupations. In fact, he maintains that "not until the close of the Middle Ages, when feudalism made way for the modern industrial system, did alcoholism, as we now know it, become a recognised fact in social history." This is an important generalisation, and may serve for a passing reflection. It may be safely contended that the five causes of alcoholism are—(1) Fatigue, (2) climate, (3) physical degeneration, (4) primary pathological neuroses, and (5) habit. Of these, several are interrelated, and others stand in the relation of cause and effect. Drink is a kind of short cut to vitality, over preserved ground set with traps—certainly with gins—and likely in course of time to be accepted as a right of way. Habit acts as a companion to necessity, and the evil results. And it is on this very question of habit that we would particularly wish to dwell. For we believe that at least 70 per cent. of people who drink do it not from any desire either to appease thirst or to stimulate a lagging vitality. Drinking has become one of the daily tasks of a large proportion of the industrial classes. No great social ban is put upon the practice, and as that inhibitory power is wanting, the matter becomes almost entirely a personal one. Drunkenness has ceased to be a characteristic of the upper classes, because it is no longer regarded as a proper practice for a gentleman; and the fact that these classes found it so easy to adopt more temperate habits, proves the contention that the question of mere habit is at the root of much of the evil. "Come and have a drink" is no longer regarded as a part of the necessary courtesy of a friend; and let that fact be recognised by the lower orders, and we will do away with a large proportion of the evil. A great mass of people indulge in drinking who really at their heart of hearts do not care for it at all, but still cling on to the shibboleth that it is a manly and sociable custom. There exists amongst a certain class an almost fanatical dislike to be thought a teetotaller, and people of that category have no fine distinction between temperance and absolute negation. Let promiscuous drinking be regarded as the practice of an idiot, and drunkenness the habit of a criminal, and we will go far to remedy the evil. This cannot be done by legislation alone, but by the opinion of the class in which the individual sinner moves. Let it not be a movement of unctuous self and social righteousness, otherwise the resistance will become stronger than ever. Let it be free from a "spoil-sport" spirit. Something manly, bright, disinterested—the frank expression of a class which recognises human limitations, and is not averse to a little "cakes and ale and hot ginger." Frankly, we have not much liking for the ordinary temperance reformer. He is generally a gloomy individual, who distributes tracts and sings hymns, without doing much more. Tracts would, no doubt, be excellent things in their way—if they were written by literate people, and were free of that unreal sentimentality which arouses resistance in the ordinary man; and we have no objection to hymns—if they are to the point. The kind of men who can do most good are not those who preach perfection and live on water and beans, but the men who live on the ordinary level of life, eat and drink temperately, and are not overloaded with crank ideas or strong prejudices. The appeal must be a manly one, not a sniggering nor a self-righteous one. It may be flavoured with ridicule and satire, for nothing rouses a man's self-respect more than gentle and genial ridicule of a stupid habit, and a running satire on his absurd practices. We should like to see established a body of "men of the world" reformers, and we believe that their influence amongst the pagan classes would be stronger than that exercised at present by more exclusive moralists. We have no desire to belittle the great efforts of the past, and the equally honest methods of the present; but there is something lacking. There is not a sufficient atmosphere of sympathy and confidence. It is useless for us to shut our eyes to facts. The ecclesiastical reformers have not that hold of the people that they had; and although they are not to be tried at the bar of public confidence and condemned to outer darkness, yet their efforts must be seconded by men who are much in touch with human failings, and more sympathetic with those who "indulge in the minor evils." If our labour organisations and socialistic committees would take the matter up with the energy that they apply to mere political reform, much good might result, a more healthy spirit of resistance and condemnation might ensue. Sow a class habit, and you will reap a class character; sow a class character, and you will reap a class destiny.

Autonomy.

NOT the least interesting and important subject discussed at the late meeting of the General Council of Edinburgh University was that of the formation of a Legislative Council, which it was proposed should be the governing body of the University. This suggestion originated with the Business Committee of the Council, and was put forward tentatively as a basis for discussion, and as such was approved by the General Meeting.

The suggestion raises once more a very vexed question, and one which has from time to time agitated the minds of those who are desirous that the University should be permitted to escape from the more than theoretical thraldom in which she at present labours.

We do not require to revert in detail to the ridiculous system of bondage through which the Scottish Universities are fettered together. It is sufficient to say that under the present ordinances individual progress and action is effectually prevented, and the pace of much needed reform is at present set by the most conservative and inert partner. The suggestion that jealousy and pure selfishness play no inconsiderable part in the attitude of the four sister bodies to each other has not infrequently been heard, and we are not prepared to deny that good grounds do not exist in support of it.

It is said that the four-in-hand arrangement acts as a check on hasty and ill-advised schemes promoted by individual Universities, but for every instance in which this argument might have some weight, there are abundant cases in which the arrangement acts prejudicially. Let us take one comparatively recent example. Edinburgh was desirous of instituting a department of Veterinary Science. The time was ripe; the tendency of modern medicine is daily towards a closer union between the study of the diseases of man and those in the lower animals. The opportunity for the change also offered itself. A well-known school of veterinary teaching was on the point of dissolution; a competent staff and appliances were available; Edinburgh was willing, but Glasgow objected, and an English University, autonomous and shrewd, seized the opportunity, with the result that not only a valuable teacher, but also a large body of students, have been lost to us. Whether the proposed Legislative Council is the best method of governance, once autonomy is secured, does not really affect the main question at issue. The proposal may, as a certain distinguished professor remarked at the meeting, savour overmuch of the "mushroom universities of England, and be too obviously tainted with the ideas of Birmingham; he preferred methods made in Germany, and this body might, if elected, reduce University management to a state of chaos." As we have already stated, it at any rate forms a basis for discussion, and brings forward once more the plain and obvious demand which all interested in the welfare of our University must and will reiterate for self-government and a freedom of action, unhampered by the more or less disingenuous opposition of other academic bodies.

Clothes and Custom and Hygiene.

OUR contemporary, *The Lancet*, in a recent number, has some words in season as to the bracing effect of a change of clothes, in special reference to the custom called "changing for dinner." "Many a man, feeling almost too fatigued after an arduous day's work to change his clothes, finds himself considerably refreshed when the change is accomplished, and at the same time he experiences a feeling of cleanliness and preparedness for his dinner, and good digestion invariably waits on healthy appetite." The truth of this is sufficiently well known to all of us, and need not be pushed further here. We should like to go a little further than our contemporary, and maintain that the habit of not changing for dinner is in the main a fairly good test of character. We are speaking, of course, of those who are bound by the conventions and customs of dress, and all those who accept social privileges are included under this category. We do not hold that there is anything particularly noble and moral in the matter of dress habits. They are of the class of customs that serve to add picturesqueness to life, and as matters stand it is idle to run our head against such established manners. Apart from the hygienic point of view, there are clothes for occasions well defined and clearly stated, and it seems to us that a man has as much right to appear in pyjamas or motor costume or a shooting suit as to present himself at the dinner table in his ordinary work-a-day clothes. It is all a matter of convention, but if conventions are accepted, then a man out of respect for himself, his wife, his children, and his neighbours, ought to wear the correct costume on the right occasion. We know the type of man well who dresses when he comes to dine with you, but wears tweeds or flannels when he takes his evening meal at home. This is the person who is careless of both hygiene, good taste, and the necessary compliment to be paid to his wife. He is a typical sartorial Pharisee, who is content to wash only the outside of the cup and the platter, and only then when under the public gaze. He will generally be found to be selfish, indolent, and essentially uncleanly. One will have a right to suspect that he neglects, as often as he can find an excuse, his morning tub. He will appear at breakfast in slippers, and, occasionally, even in his dressing-gown. Sometimes he gives one the impression of having brushed his hair after he has put on his coat, and if you meet him on his holidays you will often find that he has neglected to shave. We like the man who, when he is staying out in the wilds with his wife or by himself, never neglects to appear in the right costume on the right occasion. There are times when this is impossible, but we have a respect for the person who feels uncomfortable when these conventions and courtesies of life have to be neglected. We compel our servants to wear the appropriate uniform for the individual occasion, why should we not be as strict with ourselves? We remember a quotable instance of a case where a man lost the chance of his life through the neglect of these small but indicative-of-character conventions. "I like you in many ways," said the woman, "and yet I cannot trust you to be courteous at delicate moments, for I notice that you do not take off your hat when you enter the lounge of an hotel, or when you are in a lift, or when you pass a funeral, and I hear that when alone, or with your mother and sisters, you do not dress for dinner. These may be small points to you, but they tell me much of the finer tendencies of your character. You are honest, hard-worked, and well-intentioned, but you lack the three things needful—a fine sense of cleanliness, a fine sense of courtesy, and a fine sense of humour—and dressing for dinner involves the whole three."

Dr. William Bruce, after twenty years' service as the direct representative of the medical profession of Scotland to the General Medical Council, has been unsuccessful in his endeavour to retain the position. Dr. Norman Walker was elected by a majority of over four hundred votes, and we congratulate him on his victory. This was due as much to his own untiring energy and perseverance as a candidate, as to the fact that his views upon security of tenure for parochial medical officers, and upon questions of medical education, were more in sympathy with the feelings of the profession than those enunciated by Dr. Bruce. Another consideration which no doubt exerted an influence was the opinion that the position should not be regarded as a life appointment. Dr. Bruce had somewhat outstayed his welcome, and apparently forgot that there is always a natural desire that honorary positions of distinction should go round, or at any rate that the holders should only retain them, beyond a limited period, when a very general desire is expressed for them to do so. However good a representative may be at first, yet, in our opinion, ten years is the limit, in the great majority of cases, of a man's best work on such a representative body. Notwithstanding all that we so often hear about lengthened service increasing the value of an individual representative, we believe that much more benefit results from periodic infusion of new blood into such a Council, and this view we trust will be followed in the future.

We have to record the appointment of John Malcolm Farquharson, M.B., C.M., F.R.C.P.Ed., as second surgeon to the Ear and Throat Department of the Royal Infirmary, and of J. D. Lithgow, M.B., F.R.C.S.Ed., as assistant-surgeon in the same department, also of Dr. Dingwall Fordyce, F.R.C.P.Ed., as one of the assistant physicians to the Royal Hospital for Sick Children.

We have also to note the appointment of Mr. George Berry, F.R.C.S.Ed., and of Dr. Mackenzie Johnston, as representatives of the Royal College of Surgeons on the Board of Management of the Royal Infirmary. Both of these gentlemen have recently retired from the active staff of the Institution, and are therefore in a position to afford valuable assistance to the Board in questions affecting the administration, and in promoting harmonious relations between the Staff and the Managers.

We have to congratulate Dr. C. E. Underhill upon his elevation to the presidential Chair of the Royal College of Physicians, and we only give expression to the general opinion in stating that in his hands the honour and advancement of the College will be assured.

At the Annual Meeting of the Royal College of Physicians held on the 6th inst., Dr. Charles E. Underhill was elected President of the College; Dr. John Playfair, Vice-President; and Sir Thomas R. Fraser, Sir John Batty Tuke, M.P., Dr. W. Allan Jamieson, Dr. James Ritchie, and Dr. R. W. Philip, were elected to the Council. At an Extraordinary Meeting, held on Tuesday the 18th inst., Dr. James O. Affleck and Dr. Charles E. Underhill were re-appointed representatives of the College on the Board of Management of the Royal Infirmary.

The Annual Dinner of the Royal College of Physicians was held on the 20th inst., and was attended by one hundred and forty Fellows and guests. Dr. Underhill, the newly elected President, occupied the chair with dignity and acceptance. The toast of the Services was responded to by Fleet-Surgeon Lomas and Colonel Corker, P.M.O.; the toast of the evening, that of the College of Physicians, was proposed by the Earl of Rosebery, and among other speakers were Lord Provost Gibson and Sir Thomas Barlow.

ORIGINAL COMMUNICATIONS.

THE PRINCIPLES UNDERLYING THE SURGERY OF THE STOMACH AND ASSOCIATED VISCERA.[1]

By William J. Mayo, A.M., M.D., F.R.C.S.Edin., LL.D., *Rochester, Minn., U.S.A.*

Clinical Surgery as applied to the stomach has lacked an accurate physiological and pathological basis. Certain diseased conditions have been relieved successfully, but the reason for the results have often not been satisfactorily explained. This is especially true in regard to function. We have in the past founded our knowledge largely upon the scientific study of the dead, but this kind of information is grievously open to error, inasmuch as secondary complications and terminal infections frequently obscure the initial lesion, so that from the post-mortem evidence we are not always able to get a clear mental picture of the disease during the curable period. The immediate cause of death may, apparently, be disassociated from the primary lesion, which, although completely healed, had set in motion the fatal pathological process. As a foundation, medicine is greatly indebted to post-mortem pathology, but as a superstructure this has a less exalted position, and too closely followed leads to inefficiency and pessimism.

Modern surgery has dealt with the practical side and established a "living pathology." It has cleared up those three great avenues of peritoneal infection,—the Fallopian tube, the appendix, and the gall bladder,—and is now engaged in a surgical investigation into the diseases of the stomach. The problems to be elucidated, however, are very different from those just mentioned, as infections, primarily, play but a small part in gastric pathology. The gap between the knowledge obtained from post-mortem study and the clinical findings must be bridged by animal experiments.

We have in the past depended too much upon form without inquiring sufficiently close into function. At present there is an extraordinary interest in physiological experimentation, and its effect upon surgery has been most beneficial. The work of Carel, Crile, Cushing, and especially Cannon, whose investigations in this field have added so largely to our real knowledge, are conspicuous examples of the trend of recent progress.

A vast amount of work in the practical and comparative anatomy of the gastro-intestinal tract has been done by Cunningham, Huntington, and others, and in the experimental physiology of the digestive system by Pawlaw, Starling, and a host of co-workers.

It is with the view of bringing together, and correlating some of the undigested facts in embryology, anatomy, physiology, and pathology, which have a bearing on sound surgical practice, that this paper is written.

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[1] One of the winter lectures delivered before the College of Physicians, Philadelphia.

Section I. EMBRYOLOGY.—The study of the embryology of the gastro-intestinal canal is most interesting and instructive, and shows how much more permanent is function than form. The primitive intestinal tube is composed of three fundamental parts, the "fore-gut," "mid-gut," and "hind-gut." In form the small intestine begins at the pylorus and the large intestine at the ileo-cæcal valve, but functionally they maintain the rudimentary type, the small intestine beginning in the duodenum, just below the common duct, probably at the muscle described by Ochsner, which he has shown is to be found near the juncture of the second and third portions of the duodenum[1] and the large intestine beginning near the splenic flexure of the colon (Keith). The ancients, in calling the cæcum a second stomach, were much nearer the truth than we have thought.

From the embryological fore-gut we get the tongue, the back wall of the pharynx, the œsophagus, the stomach and duodenum to its third portion, the liver and pancreas being developed from the duodenal end. The gall bladder and common duct are direct invaginations of duodenal structures (Cunningham). It will be at once noted that all of these organs having their origin in the fore-gut have to do with the preparation of food for digestion, but are not themselves capable of absorption. The stomach and duodenum have some selective action in absorbing certain things, such as stimulants, but practically, so far as food and drink are concerned, they are unable to do so. In operating upon the upper gastro-intestinal tract, soon after a meal, I have often been struck with the milky lines made by the full lacteals in the jejunum, while no such appearance was present above this point.

The duodenum with its wide calibre and fixed position and with its delivery point nearly as high as its pyloric origin, enables the chyme from the stomach to be thoroughly mixed with the pancreatic and biliary juices, absorption taking place below Ochsner's muscle. The jejunum and ileum take up the solid portions of the food, absorbing at least 90 per cent. of the proteids, but by no means do they make way with all of the fluids. The contents of the ileum at the ileo-cæcal valve are still in the liquid state, though the ingesta have lost the bulk of their nutritive elements. The cæcum absorbs the fluids which are held for this purpose between the ileo-cæcal apparatus and a physiological muscular contracture (the cæco-colic sphincter) near the hepatic flexure of the colon. In this intestinal segment the contents are churned back and forth until the fluids have been reabsorbed and the waste solids driven further along into the transverse colon.

---

[1] See *Transactions of the Surgical Section of the American Medical Association*, 1905.

It is easily seen that the mid-gut retains its primitive characteristics; in the jejunum, ileum, caecum, and adjacent colon, all of the absorption takes place. Man prepares his food with the organs which have their origin in the fore-gut and absorbs his nutrition from the derivatives of the mid-gut, *i.e.* he eats with the jejunum and ileum and drinks with the caecum. The posterior "no-loop" gastro-jejunostomy does not, therefore, deprive the patient of any appreciable amount of absorbing surface, and the nutrition is in every respect normal. The caecal function explains why cholecystenterostomy into the hepatic flexure of the colon has proved so successful an alleviation in complete obstruction of the common bile duct, when the duodenum for any reason could not be used for the purpose. When a permanent external cholecystostomy is made, the patient loses with the bile discharge 20 to 30 oz. of fluid each day, thereby being compelled to drink a larger quantity of liquid, and at best shows sign sof dehydration, whereas, when the bile fluids are turned into the caecum they are quickly reabsorbed. The effect of the bile in digestion, especially in aiding the pancreatic ferments, is of course lost, but its usefulness upon the function of the large intestine is preserved.

The value of water in the human economy is testified to by the fact that it is redistilled in the caecum and used in the system over and over again. The mechanical effects of fluids in carrying solids as far as the caecum, cannot be overestimated, but beyond this situation liquids would interfere with the storage function.

The primitive hind-gut begins near the splenic flexure of the colon, and although largely a matter of convenience, this portion of the intestine has a very considerable nutritive function. The normal action of the colon is an antiperistalsis, excepting during defaecation. Mr. Bond, in his most admirable address on Surgery before the British Medical Association in 1905, shows that particles of indigo-carmine, placed inside the anus, are carried upward by what he calls "reverse mucus currents." This process occurs close to the intestinal mucous membrane, and takes place in spite of bowel passages.

Cannon in his experiments also finds that antiperistalsis is the normal movement in the large intestine. By selective action valuable food elements, and especially fluids, are carried back into the caecum. Great advantage has been taken of this physiological fact by the giving of saline infusions by the rectum. Murphy has shown that salines introduced very slowly into the rectum will be absorbed with great rapidity, largely by reverse peristalsis to the caecum. From two to four quarts, which otherwise could not be introduced into the body except by hyperdermoclysis or venous transfusion, can be taken up in this manner. Especially valuable is this in connection with gastric surgery, when the stomach is not available and fluids are essential.

Comparative physiology is interesting as showing that in carnivorous animals digestion is practically completed in the small intestine, while in the herbivorous the colon is equally important on account of the liquid nature of the plant and grass juices upon which they depend for nourishment. The human species occupies an intermediate position.

Section II. ANATOMY.—The dome of the stomach follows the curve of the diaphragm, and rises above the œsophageal opening. In searching with the hand in the stomach for the cardiac orifice, one unconsciously tends to pass above the actual situation, especially as on irritation the cardia contracts, leaving the mucous membrane nearly smooth. A little dimple, however, can be found, and steady pressure at this point for a short space of time allows the finger to pass through the opening.

The lesser curvature has a somewhat fixed position; in the anæsthetised patient about two-thirds of its extent hanging nearly longitudinal with the long axis of the body, while the lower horizontal third turns sharply to the right and somewhat upward, varying from two to three and a half inches in length. Distension of the stomach comes about almost entirely through alterations in the relations of the greater curvature.

The stomach is a contractile organ, exercising its functions through muscular action, gravity playing but a small part in the onward progress of food. When distended, it extends downward and to the right, the pylorus being carried across the median line and upward to prevent the weight of the food resting against the pyloric sphincter. In all distended organs having storage function, this elevation of the outlet will be found to prevent continuous exertion of muscular force for retention purposes, as shown in the urinary and gall bladders.

The stomach is emptied of its contents, not only by general contraction, but also through muscle bands which extend downward from the fundus, grasping the greater curvature (Cannon). As these bands contract, the greater curvature is shortened, and the pyloric outlet brought more nearly to the bottom of the cavity.

In a general way it can be said that all of the stomach lying to the left of the longitudinal part of the lesser curvature has storage function (fundus), about four-fifths of the whole (Starling); on the right, having the horizontal part of the lesser curvature as its superior wall, is the antrum, the grinding portion of the stomach. There is said to be a slight thickening of the circular muscular fibres at the entrance to this cavity. Starling states that this is apparent rather than real, and that the antrum is a physiological and not an anatomical compartment. By contraction of these circular muscle fibres the food masses are powerfully held in the pyloric end during the kneading process, some prepared chyme escaping through the pylorus, while a much larger amount of food is ejected backward into the fundus, which steadily compresses the whole. In pyloric obstruction the antrum loses its identity, and becomes a part of the distended fundus, as in the cadaver, accounting for the perfect drainage of a gastro-jejunostomy; whereas, if the same operation is done and the pylorus be unobstructed, the artificial stoma fails to drain, and is often productive of harm, as the muscular action of the stomach propels the food out through the normal outlet, without regard to the gastro-enterostomy.

The terminal three-fourths of an inch of the stomach next to the pylorus can be classed with the pyloric apparatus, having but comparatively little to do with the food grinding, and acting rather as a funnel with the apex at the pyloric ring (the pyloric canal of Jonnesco). The pylorus, under the muscular contractions of the stomach, projects into the duodenum, and, from the duodenal side, greatly resembles the vaginal portion of the cervix.

The importance of these muscular features is shown by the fact that nearly 80 per cent. of all ulcers of the stomach are situated in this grinding, pyloric end, the most common variety being the saddle ulcer of the lesser curvature, extending flap-like down the anterior and posterior surfaces (pre-pyloric). The ulcer crater, if one be present, will usually be found upon the posterior wall, or there will be two ulcers facing each other, one anterior and the other posterior, connected superiorly by a bridge of induration.

The pylorus is seldom primarily involved in ulceration, as the pyloric canal is normally contracted, and is less exposed to mechanical injury or the presence of an excess of acid secretions. The large majority of so-called pyloric ulcers are in reality duodenal. The latter ulcer extends up to the pylorus, or within three-fourths of an inch of it, in 96 per cent. of all the cases: error in accurate localisation has led to mistaken identification. As a matter of fact, we find at the operating table that no less than 40 per cent. of all gastric and duodenal ulcers are situated in the duodenum.

On the peritoneal surface of the gastric side of the pyloric ring will be found a peculiar arrangement of the blood vessels which is nearly constant. From the lower side a thick vein passes upward somewhat more than half-way upon the anterior surface. From the upper border a second vein reaches downward in the same line, nearly, if not quite, meeting the first.

Not only is ulceration most frequent in the antrum, but the topography of gastric cancer will be found to be the same as ulcer. In 54 per cent. of 134 resections of the stomach we found malignant disease originating in the submucous tissue at the margin of an ulcer. Primary cancer of the duodenum, however, is rare. We have seen only two instances, although three times we have found carcinoma developing on the gastric side of a duodenal ulcer which had involved the pylorus.

The pyloric antrum occupies a sheltered position under the left lobe of the liver, and this is also true of the duodenum above the common duct. As contrasted with the remainder of the stomach, acute ulcer perforations into the free peritoneal cavity are relatively uncommon in the antrum on account of the ease with which adhesions to the liver, gastro-hepatic omentum, and suspensory ligament and gall bladder are created, and these tend to prevent the gastric contents from escaping. The cardiac end of the stomach has no such protection, and although this region has but 10 per cent. of the total number of ulcers, acute unprotected perforations are here more frequent than in the entire antrum. Perforations of duodenal ulcers are more common than gastric, but the sheltered situation of the duodenum enables ready adhesive protection, while its contents are nearly sterile, and relatively small in amount.

The blood vessels supplying the stomach are all from the cœliac axis, and are four in number: the gastric, which reaches the stomach on the lesser curvature, just below the œsophageal opening; the superior pyloric branch of the hepatic artery at the pylorus; the gastro-duodenal, which gives rise to the right gastro-epiploic; and the left gastro-epiploic from the splenic artery.

The blood vessels of the lesser curvature lie in the wall of the stomach: those of the greater curvature are to be found at a considerable distance from the gastric wall, arterial branches passing upwards from the gastro-epiploics upon the stomach, anterior and posterior in a sawback manner. When the stomach is distended, this permits the greater curvature to sag downward toward the blood vessels without compressing them, enabling rapid changes in size and position.

Tortuosity of the uterine arteries makes possible the great size of the uterus during pregnancy, because it comes on slowly; but tortuosity would not allow the rapid changes to which the vessels of the greater curvature of the stomach are subjected. By tying the four blood vessels, gastrectomy can be made bloodless, just as hysterectomy is in the modern operation.

The lymphatic arrangement is nearly the same as the vascular, but varies in one important particular. On the greater curvature no lymph nodes are to be found to the left of its middle, and the lymphatic circulation of this region is from left to right (Cuneo). Therefore, in radical operations for cancer, it is possible to save a great deal of the greater curvature. On the contrary, in the lesser curvature the lymphatic structures lie in the submucous tissues, rendering it necessary, in every case of carcinoma of the pyloric end, to remove all of the lesser curvature as high as the gastric artery (Mikulicz). The glands about the pylorus are most numerous on the inferior surface, although several are found just above it in the line of the pyloric artery. The relation of these glands to the field of gastric cancer was long ago dwelt upon by Kocher. The dome, arising above and to the left of the cardiac orifice, is disconnected from the remainder of the stomach in its blood and lymphatic supply (Robson and Moynihan).

Looking at the lymphatics of the stomach in a general way, it greatly resembles the other hollow viscera of the body: the neck of organs is the region of the lymphatics, the fundus being less well supplied.

Section III. PHYSIOLOGY.—Thanks to the investigations of a large number of experimental physiologists, we know many of the secrets connected with the functions of the stomach and duodenum. One important fact developed is that the stomach not only has many ferments, but that these are called into action by the character of the ingesta, and that they can be increased or diminished by appropriate diet.

Gastric function is carried on to a considerable extent independent of the nerve supply; the chyme, when ready to leave the stomach, has attained a proper acidity, and this causes contraction of the gastric muscles, the pylorus automatically opening to permit its escape. The duodenum also has control over the pylorus, and acidity is here again a feature influencing the pyloric closure. According to Kelling, the chemistry of the duodenal contents is the most important agent in the control of the pylorus. The mucous membrane of the antrum produces specific substances called hormones (Starling), which, acting with nerve impulses such as sight, taste, and smell, control the amount of food ingested and the necessary gastric secretion.

Not only is much of this process the result of chemistry, but the same force, through the vascular system, stimulates the glandular activity of the liver and pancreas. It has been shown that the introduction of chyme into the duodenum causes pancreatic secretion by means of a product of the intestinal mucous membrane called "secretin," when the pancreas has no connection with the body excepting its blood supply. The great protective agent in preventing self-digestion in the stomach is mucus, and this is apparently true of the entire gastro-intestinal canal.

The stomach equalises the temperature of the ingesta, macerates the food masses in a weak solution of hydrochloric acid and pepsin, and converts the contents into a harmonious whole, the muscular action of the pyloric antrum being the active agent in the latter process. The cardiac end is a temporary storehouse which enables its possessor to rapidly place a quantity of material where it can be drawn upon as digestion proceeds. To a large extent, then, the stomach is a convenience, and obviates the necessity of continuous feeding, just as the urinary bladder and the large intestine beyond the splenic flexure are conveniences to prevent continuous elimination.

Excess or changed secretions, especially acidity, seem to lie behind much of the pathology of the stomach, accounting largely for ulcer in the pyloric antrum and duodenum above the common duct, with its alkaline secretions. Trauma plays an important part in the production of ulcer. We have but to remember the frequency of this malady in the grinding pyloric end of the stomach, and to note that duodenal ulcer usually originates at the point which received the impact of the chyme forcibly ejected from the pylorus, to appreciate the influence of local injury in gastric disease.

It has been supposed that gastro-jejunostomy would pass the food too quickly from the stomach into the intestine. This fear, however, has been proven groundless, as the stomach does not contract in such a manner as to empty its contents until the proper chemistry has been reached, and the food is ground in the antrum before propulsion is begun.

It is altogether probable that modern methods of food preparation have greatly changed gastric digestion, and that a considerable share of the now very prevalent diseases of the stomach are due to modern dietary changes from primitive conditions, just as the loss of necessity for the grinding action of the teeth has resulted in their premature decay.

In aboriginal races many diseases of civilisation, such as appendicitis, gall stones, ulcer, and cancer, seem to be rare (Senn).

The nerve supply of the stomach is of two kinds, the vagus and the sympathetic. During fœtal rotation, the stomach turns upon its right side, which thereby becomes the posterior wall, and the left vagus lies anteriorly. Terminal filaments of the vagi join with the sympathetic fibres from the abdominal ganglion, and form the plexuses of Auerbach and Meissner, which lie in the gastro-intestinal wall.

The control of the cerebro-spinal nerves over the stomach is limited, and has to do with food requirements, but, so far as actual digestion is concerned, the sympathetic is the controlling factor. Beyond the stomach the cerebro-spinal system is even less influential until the sigmoid and rectum are reached, where again conscious control is essential.

The sympathetic nervous system, developed from mesoblastic tissue, is undoubtedly the primitive one. It is closely allied with the control that is inherent in the gastro-intestinal muscles, and which is myogenic in origin, and of the same nature as His's heart muscle-band, which regulates the heart beat. The action of the gastro-intestinal canal is regulated largely by this mysterious myogenic force.

The sympathetic nervous system has retained to a large extent its primitive control over those organs which have to do with the maintenance of the body, but it is altogether probable that it is losing its prominence on account of the overshadowing development of the cerebro-spinal system, and just as other vestiginal organs like the gall bladder, appendix, and wisdom teeth seem to develop a tendency to disease, so possibly does this mysterious nerve body. It is within the realms of possibility that abdominal ptosis and many forms of neurasthenia are characteristic expressions of evolutionary instability in the sympathetic.

The one essential difference between the sympathetic and cerebro-spinal system is that the sympathetic is not segmented, and is therefore unable to prevent general disturbances upon irritation of any of its component parts. This is especially interesting in connection with certain diseases of the stomach, which are exceeding misleading, and which apparently have a common origin, such as pyloric spasm, atonic dilatation, prolapse of the stomach, and gastric neuroses. Now that surgery of the stomach is occupying such an important place, it is vital that we should eliminate these conditions from the operating room.

We have had a surgical opportunity in a considerable number of cases to examine the stomach during that contraction of the pyloric canal and antrum, which constitutes "pyloric spasm." This muscular contraction when present causes the patient to experience a sensation which he speaks of as gas pain. It can be observed in operative examination under local anaesthesia. The peculiar appearance of the stomach during pyloric spasm may give rise to the belief that physical disease exists, because of a roughened, puckered appearance, which lasts a fraction of a minute, and then changes position or develops a rhythmic contraction, confined to the antrum.

In the most extreme degrees we have found it in connection with stones in the appendix, impacted gall stones, tuberculosis of the intestine, and chronic intestinal obstructions of various kinds. Clinically it would appear that irritation of any part of the gastro-intestinal canal and allied organs, the liver and pancreas, may produce pyloric spasm, and that this condition may overshadow the local disease. The greatest care is necessary in differentiating these cases from gastric ulcer and other inflammatory infections.

While it is possible that pyloric spasm may exist as the result of a mucous ulcer as believed by Eiselsberg and Doyen, such is not our conviction, although it will mimic gastric ulcer clinically, and is often diagnosed as such. We are inclined to look with a great deal of suspicion upon any ulcer of the stomach which cannot be absolutely demonstrated not only to the operator, but to onlookers as well.

Section IV. BACTERIOLOGY. — The contents of the fasting stomach are relatively sterile, and this is equally true at the height of digestion, the chyme when discharged into the duodenum being nearly free from pathogenic organisms. This is due largely to the acid gastric secretion; while not actively germicidal, the general influence of all of the secretions of the stomach are against germ life. Cooking renders a large amount of the food consumed sterile, but many organisms during mastication are picked up from the mouth, which teems with bacteria of all kinds (Harrington). Cushing found that with sterilised food the discharge from a jejunal fistula was free of micro-organisms (providing the mouth was kept in good condition), and recommended, in addition to sterilising the food, antiseptic oral washes and careful cleansing of the teeth previous to operations upon the gastro-intestinal tract. The vigorous use of the tooth-brush to those who are not accustomed to it, at the end of a few days may start up a gingivitis, and temporarily increase the virulence of the organisms. Such oral antisepsis in this class of patients should begin at least two weeks prior to the operation. As the average patient cannot be kept in preparation such a length of time, the practical importance of this step in the individuals just referred to is not great. A moderate number of bacteria, particularly bacilli, pass with the food into the duodenum and members of the colon group work upward from below.

Adami and Ford have shown that leucocytes pass out upon the free mucous surface of the duodenum and upper jejunum picking up particles of fat and micro-organisms of various kinds, particularly bacilli, and by phagocytosis destroy them in the neighbouring lymphatics. Some bacteria, however, are continuously carried to the liver and there annihilated, the pigments of the slaughtered organisms giving rise to the little pigmented areas sometimes found in the liver. A varying number of bacteria, however, are passed through the liver and excreted with the biliary secretion. The bile, therefore, must be looked upon as always infected, and it is probably this attenuated infection which gives rise to gallstone disease (Lartagau).

The relative sterility of the stomach and duodenum and the upper jejunum shows why gunshot wounds of this locality have been so much more often followed by recovery when operated upon than those further down in the intestinal tract.

One interesting feature in this connection concerns the reason why gallstone disease is so much more frequent in women than men. In 1700 of these patients upon whom we have operated, three-fourths have been women, while just the opposite has been true of duodenal ulcer. In 200 operated cases of the latter disease, 73 per cent. were males, and only 27 per cent. females. Granting that biliary infection is equal in men and women, is this sex disproportion due to different mechanical conditions? We have been investigating during life a considerable number of subjects, with a view to determining whether there was a difference in the arrangement of the duodenum and common duct which favoured ascending gall bladder infection in women, and also as to whether the mechanics in men were unfavourable for permitting the alkaline discharge from the common duct to quickly neutralise that excessive acidity of the chyme which seems to lie behind the etiology of duodenal ulcer. We have not been able to satisfy ourselves that there is sufficient anatomical difference to explain the phenomena. There is no question that bacteria can travel up the common duct into the gall bladder. Bond found that indigo-carmine placed within the anus could be detected in the gall bladder in about forty-eight hours. It is probable that this sex difference is physiological rather than anatomical, and possibly due in some way to the potential capacity of the female liver to care for mother and child.

As one passes down the intestinal canal, bacteria increase in numbers and in virulence, and in the large intestine bacterial growth adds considerably to the bulk of the stool. The acid change which takes place in the large intestine is probably caused by germ life rather than intestinal secretions, as the large intestine, when entirely free from fæces, has, like the small intestine, an alkaline reaction (Bond).

The problem of securing asepsis during operations upon the upper abdomen is most interesting. To one who reads about the gastric surgery of five and ten years ago, the frequency of fatal results from pneumonia following operations upon the stomach is most noticeable, and had various explanations, the anæsthetic and the aspiration of gastric contents regurgitated into the œsophagus being the most generally accepted hypotheses. In Mikulicz's clinic it was brought out that part of the venous blood from the stomach, instead of passing through the portal vein so that the liver might sterilise it, returned directly through the vascular anastomoses about the cardiac orifice, and that this unsterilised blood was the cause of a pneumonia which was embolic in character.

Muscatello demonstrated that the endothelial serous lining of the diaphragmatic area was exceedingly active in absorption, and, based upon this, Clark elevated the foot of the bed after abdominal operations to ensure rapid absorption of septic products and prevent peritonitis. The unshed blood in the vessels has no germicidal properties; and this septic material, when absorbed before being acted upon by the proper tissues, was carried to the lungs, producing embolic pneumonia of the same variety that had been noted after operations on the stomach. Fowler pointed out that the inherited resistance to peritonitis in the pelvis, which had been brought about by tubal diseases in women and appendicitis in both sexes, caused absorption in this locality to be slow, and therefore advised that, in peritoneal sepsis, the head of the patient's bed should be raised, and a drainage tube introduced into the pelvis to drain away the discharges. In connection with general septic peritonitis, we followed the Fowler method, excepting that we raised the patient's head and chest much higher. The betterment in the mortality in peritonitis, actual or impending, was remarkable, although it was soon noticed that although the patient did very well, there was often no drainage from the tube, therefore drainage was not the sole factor.

In work upon the upper abdomen on the left side, any fluids at once gravitate towards the diaphragm: on the right, they are prevented from doing so by the liver. To prevent rapid absorption of these unsterilised products, the raising of the diaphragmatic area so as to drain this material into the pelvis is of the first importance, as here, by means of the omentum and pelvic colon, any septic particles can be rendered harmless by absorption through the lymphatics and radicals of the portal vein. So far as these organs which lie within the active radius of the portal vein are concerned, the liver must be looked upon as an adjuvant to the lymphatic glands in the destruction of micro-organisms.

The omentum, according to Dickinson, is the most important agent in developing phagocytosis and opsonins, its germinating endothelium is constantly producing lymphocytes, and is capable under proper stimulation of throwing both newly formed phagocytes and those called from a distance into germicidal action. This process is aided by the vermicular and swaying movements of the intestines, which, in spite of gravity, brings all parts of the small intestinal wall in contact with the omentum, the epiploic tags having the same function for the more fixed large intestine.

Dudgeon and Sargent have shown that from some source the *Staphylococcus albus* first appears in peritoneal sepsis, and rapidly produces a mild infection, and this furnishes the necessary stimulus to the protective endothelium, so that the phagocytes are attracted in time to destroy the more virulent but later developed bacteria.

Bond has demonstrated that the plastic exudate produced by the *Staphylococcus albus* protects the weakened endothelium, and prevents the micro-organisms passing directly into the blood stream. When absorbed by sound endothelium, bacteria are carried into the lymphatics and destroyed.

In closing, let me quote from Dr. W. H. Welch's recent address on the occasion of the dedication of the new buildings of the Harvard Medical School:—

"There is a highly significant and hopeful scientific movement in internal medicine and surgery to-day, characterised by the establishment of laboratories for clinical research, by the application of refined physical, chemical, and biological methods to the problems of diagnosis and therapy, and by the scientific investigations along broad lines of the special problems furnished by the living patient."

A CASE OF VOLVULUS OF THE SMALL INTESTINE AT A MECKEL'S DIVERTICULUM: TOGETHER WITH SOME OBSERVATIONS ON "SUBACUTE ILEUS" AND THE PERFORMANCE OF GASTROSTOMY FOR PARALYSIS OF THE SMALL INTESTINE.[1]

By Professor K. G. Lennander, M.D., LL.D., Hon. F.R.C.S. Eng. and Edin., *Upsala*.

Case.—The clerk, N. J. N., from Dalecarlia, was admitted on 10th January 1906 to the surgical side of the Academical Hospital at Upsala, and died on 15th January. He had always enjoyed good health, with the exception of an acute abdominal attack during April and May 1905, which by his medical attendant was regarded as appendicitis. No resistance was felt at the time. After recovering from this, he had suffered no more from his stomach, although the action of the bowels had been rather sluggish, especially lately. On 8th January 1906 the patient was taken ill with pains in the cæcal region and a feeling of sickness; during the morning he had two spontaneous movements of the bowels, the last one rather loose. At noon, when the patient was seen by his physician, the abdomen was somewhat distended. To the right and somewhat below the umbilicus there was marked tenderness over an area of about the size of half a crown, and here could be felt a distinct resistance, well defined to the right. Rectal examination the same day revealed some tenderness forward and to the right, together with some increased fulness. Temperature, 37°·2, 37°·5; pulse, 68, 75.

On 9th January the tenderness had spread a little to the left of the middle line; the pains in the abdomen had also spread upwards as well as to the left; on percussion there was distinct dulness over the area of resistance; the tenderness per rectum not increased, but increased fulness could be felt. Eructations and nausea continued during the day, but towards evening were less troublesome. During the day the patient was given three small enemata of about ½ litre tepid water; these gave some relief, but caused neither movement of the bowels nor escape of gas. The temperature in the morning was 37°·4, at noon 37°·7, in the evening 37°·5; the pulse at the same periods was 77, 73, 74 to 68. In the afternoon the pain became more severe and more diffuse over the abdomen.

On 10th January, after a quiet night, his condition was as follows: the pain, as well as the tenderness, is still more widely diffused; the nausea continues; per rectum there is no increase of the tenderness or fulness; there is no albumin in the urine. In the morning the patient was given ¾ cgrm. of morphia hypodermically. Temperature at 2 a.m., 37°·3; pulse, 69; at 7 a.m., 37°·2; pulse, 80 to 75; no chills.

No flatus had passed since the movement of the bowels in the forenoon of 8th January. The patient had taken no food since the evening of the 7th. From noon on the 8th to the afternoon of the 9th, he got 50 drops tinctura opii in five doses of 10 drops. The patient was admitted to the hospital on 10th January at 6.30 P.M.

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[1] A clinical lecture delivered in the Surgical Clinic at Upsala.

On admission, the patient was found to be a strongly built man in good general condition. There was no nausea. The pains were slight, and were diffused over the whole abdomen. Temperature, 38°; pulse, 92. White blood corpuscles, 7100, 7300, and 8100 per c.mm. at three different countings.

Local symptoms.—Diffuse and well-marked distension of the abdomen, with a tympanitic note everywhere except in the lumbar regions, where the note is somewhat dull. No resistance palpable. No peristalsis visible or palpable. There is great tenderness in the centre of the abdomen, over a nearly circular area with a diameter of 6 to 7 cms., and reaching about 1 cm. above the umbilicus. There is also tenderness, though less marked, from Poupart's ligament on the right side upwards to near the costal margin, and from there obliquely downwards to the fore part of the left iliac crest, *i.e.* nearly over the whole region of the small intestine. Per rectum a bulging tender mass can be felt. The outer opening of the inguinal canal is free on both sides.

The patient was operated on at 9 P.M., under ether, two and a half days after the commencement of the symptoms. The most likely diagnosis was volvulus of the small intestine, and it was considered possible that Meckel's diverticulum was involved also. *An inflamed Meckel's diverticulum was found*, adherent to the anterior abdominal wall near the umbilicus, and a *twisting* (at least through 360°) *of nearly the whole small intestine.* The constriction groove was found somewhat distal to the place of origin of the diverticulum, the proximal place of twisting was the duodeno-jejunal flexure. *There was a diffuse hæmorrhagic seropurulent peritonitis.*

Operation.—Extirpation of Meckel's diverticulum. Untwisting of the small intestine. A Witzel's fistula was made in the jejunum 45 to 50 cms. from the duodeno-jejunal flexure; another in the ileum about 1 metre above the valve of Bauhin, and a third in the cæcum, all three being provided with tubes of 3 mm. diameter.

Account of the operation.—The incision was made in the middle line below the umbilicus; it was afterwards extended upwards, and the right rectus muscle was cut across. There was a hæmorrhagic, turbid fluid free in the peritoneal cavity. The small intestine was enormously distended, and tended to protrude. In the extra-peritoneal layer of the abdominal wall opposite the umbilicus there was a cavity the size of a medium-sized apple filled with fluid and gas; this was traced into a portion of small intestine which proved to be a Meckel's diverticulum. This originated from the ileum about $\frac{3}{4}$ of a metre above the valve of Bauhin. The ileum was red, and beyond the diverticulum it was distended to a girth of about 10 cms. The mesentery of the distended intestine was twisted at least 360° in an opposite direction to the hands of a watch laid upon the umbilicus with the face upwards. The diverticulum was dissected free from the anterior abdominal wall, and resected near the ileum. The undoing of the volvulus was followed by the escape of all the distended coils outside the abdominal cavity where they could no longer be lodged. They were washed with saline solution and covered with gauze wrung out of saline solution, over which was laid a thick indiarubber sheet, and outside this again hot dry towels. After this two Witzel's fistulæ were made in the small intestine, and by a process of "milking," the intestine was emptied through the tubes. The cæcum and the ascending colon had a long mesentery, free from the posterior abdominal wall, *i.e.* the ascending and transverse mesocolon passed from the spine in direct continuation with the mesentery of the small intestine hanging down from the vertebral column. During the operation they had been twisted once. They were put right, and the cæcum fixed to the abdominal wall by applying a Witzel's fistula in the position of the anterior muscular band. After this the small intestine was examined right up to the duodenum. The bowel was just as red as before, here and there were black spots (hæmorrhages) of the size of a finger-nail. In the mesentery also there were numerous hæmorrhages. In the vicinity of the Meckel's diverticulum the mesentery was folded by adhesions resulting from an old peritonitis. No signs of contraction could be seen in that part of the small intestine which had been twisted; even the jejunal part of the duodenum was widely dilated and paralysed. The portion of the bowel in the vicinity of the fistulæ was fixed to the parietal peritoneum to the left of the abdominal incision by chromic catgut. On account of the distension of the small intestine the incision could not be closed, but the bowels were covered with an indiarubber sheet, and outside this were sewn compresses of sterilised gauze kept in place by means of sutures of metal or coarse silk passed through the edges of the abdominal wound.

When the Meckel's diverticulum was cut open, it showed a finger-wide piece of intestine, with swollen, red mucous membrane nearest the ileum. Suddenly this little intestine widened to a cyst of 6 to 7 cms. diameter containing purulent, fæculent matter, and lined with a partly ulcerated mucous membrane. It was this cyst which had been found adherent behind the umbilicus.

The pulse was at the beginning of the anæsthesia, 96. At the eventration no change of the pulse was observed; it was good and remained below 100 for nearly an hour, after which it slowly increased to 112, and later on to 120. Then a dose of 20 cgrms. camphor and 1 mgrm. strychnine was given subcutaneously, and intravenous infusion of saline solution was commenced. During the remainder of the operation the pulse improved and diminished in frequency, so that at the end it was 92 to 96, full and strong. In all the patient got 3 litres 0·9 per cent. saline solution with 16 drops of adrenaline (1 to 1000) into his veins.

The cæcal fistula was to be used for nourishing the patient. Through the fistulæ in the small intestine the bowel was to be irrigated with saline solution. Through the lower one gases and coloured intestinal contents immediately began to escape, wherefore the injections through this fistula were stopped. During the following day and night about 4000 c.c. passed through this fistula. Through the upper one scarcely anything came. Fluid injected through this upper fistula did not come back. On account of the great quantity of fluid which passed through the lower fistula, the passage between the two fistulæ was considered to be free, *i.e.* the greater part of the small intestine had immediately regained its power of contraction. As the patient felt sick and had eructations in the morning of 11th January, the stomach was washed out at 10 A.M., and a large quantity of thin, badly smelling, brownish fluid evacuated. At 12 o'clock noon the stomach was again washed out, and a smaller quantity of the same kind of fluid brought up. At the washing done at 7 P.M. the contents were of a yellowish colour. At 4 P.M. the patient was given an enema, whereby much wind and thick coloured intestinal contents escaped per rectum. Simultaneously he was given subcutaneously 1000 c.c. saline solution with 5 per cent. grape sugar and 15 drops digitalis.

The temperature in the morning of 11th January was 40°·2, at noon 40°·4, and in the evening 40°; the pulse at the same periods being 140, 140, and 132. The urine contained traces of albumin, and gave Rosenbach's reaction for indol and skatol. The quantity of urine passed during the twenty-four hours was 1150 c.c. By the evening of the 11th it was evident that both the large and small intestines had recovered their function, with the exception of the duodenum and, in all probability, the jejunum above the upper fistula. At midnight on the 11th the patient was given subcutaneously 1 mgrm. physostigmine, which immediately caused the bowels to act. Much flatus and loose fæcal matter were passed per rectum. During the 12th the patient received two intravenous infusions of 1500 c.c. saline solution with 3 per cent. grape sugar and 8 drops adrenaline (1 to 1000), the one at 1.26 A.M. and the other at 1.28 P.M.

During the night of the 11th and 12th, and up to the second operation at noon on the 12th, the stomach was washed every three hours, whereby badly smelling gastric contents of a deep yellowish colour came away. At 2 A.M. the intestine was irrigated, which caused highly coloured intestinal contents to escape. At 8 A.M. a tube was passed into the rectum, and a considerable quantity of gas and fluid intestinal contents got rid off; this was repeated at 11 A.M. and at 2 P.M.

When, in spite of frequent washings, the contents of the stomach were feculent in odour, one concluded that there was paresis or kinking of the upper part of the jejunum, and consequently at 2 P.M. *a gastrostomy was made.* Local anæsthesia was effected by the application of anestile to the skin and aponeurosis in the linea alba, and a $\frac{1}{8}$ per cent. solution of cocaine with adrenaline was injected into the subserous tissue. A Witzel's fistula was placed in the pyloric portion of the stomach near the large curvature; the tube was of 5 mm. diameter. Directions were given that irrigations with 2 per cent. hydrochloric acid solution were to be made through this tube. The fluid which escaped was to be collected in a bottle; and as soon as it had no perceptible smell, it was to be injected through the upper of the two fistulæ in the small intestine, together with some Mellins' food, beaten egg, and bicarbonate of soda.

The general condition of the patient was satisfactory during the day. He did not complain of pain. The urine showed only a trace of albumin. The temperature was taken four times: in the morning 39°·5, in the forenoon 39°·3, at noon 39°·6, and in the evening 39°·6. The pulse at the same periods was: 140, 120, 148, 128.

January 13.—The patient having had no sleep, two tablespoonfuls of a solution of bromide of potassium were given a little before 3 A.M. through the lower fistula in the small intestine. A considerable quantity of coloured matter and gas were got away by means of the rectal tube. At 2 P.M. the patient was given the first nutrient injection through the upper fistula in the small intestine, consisting of food mixed with secretion from the gastric fistula; again, at 4, 5, and 6 P.M., and so on hourly until midnight, there being at that time no more gastric secretion left to inject. He slept four hours. The urine showed a distinct ring of albumin. Rosenbach's indol reaction was negative. The quantity of urine passed during the twenty-four hours was 1320 c.c. The temperature was 39·5, 39·3, and 39·4, and the pulse 124 and 120.

January 14.—A little after midnight the patient was given 1½ grm. bromide of potassium, and at 4 A.M. another ½ grm. through the upper intestinal fistula, which induced sleep for about two hours. As before stated, there being no gastric secretion since midnight, a gruel of 100 grms. of Mellins' food with a quarter of an egg and some bicarbonate of soda was given every hour through the upper fistula.

On 14th January, at 10 A.M., the pulse not being satisfactory (unequal, irregular, about 140), the patient was given an intravenous injection of 1500 c.c. saline solution with 3 per cent. grape sugar and 12 drops adrenaline. The pulse then became much better. At noon the patient was given 2 grms. bromide of potassium in solution, through the upper fistula. At 3.30 A.M. he was given 4·5 mgrms. morphia, after which he went to sleep and slept two and a quarter hours. At 6.30 A.M. the pulse had again grown worse, and he was given 1500 c.c. saline solution with 3 per cent. grape sugar and 10 drops adrenaline intravenously. At 10 P.M., 4·5 mgrms. morphia, after which he went to sleep and slept about four hours. About 2 A.M. on the 15th, he was unconscious and violent; later on he became quieter, but never quite conscious. The pulse was good until 4 A.M. He died at 9.30 A.M.

The quantity of urine passed on the 14th was 1650 c.c., and on the 15th 650 c.c. The patient had during the 14th and 15th consumed 2600 c.c. fluid. Nothing had passed through the gastric fistula nor through the fistula in the jejunum, but large quantities had escaped through the other two: fæcal matter had also passed per anum. The whole intestine had thus regained its contractile power. The cause of death was probably stercoræmia, due to the absorption of fæcal toxins (and bacteria) from the digestive tract, chiefly before the recommencement of peristaltic action.

EXTRACT OF THE POST-MORTEM EXAMINATION REPORT MADE ON 16TH JANUARY BY K. FREDGA, MEDICAL LICENTIATE.—The intestines lying in the wound were glued together and to the edges of the abdominal wound by fibrinous adhesions in such a way that the abdominal cavity was completely shut off. The intestine lying in the peritoneal cavity showed a few small patches of thin, fibrinous exudate, but the serous covering was otherwise everywhere smooth and glistening. The contents of the abdominal cavity consisted of a few tablespoonfuls of bloodstained, serous fluid. The diaphragmatic peritoneum and the serous covering of the true pelvis were normal. The ileum, which was lying in the cavity of the pelvis, and the lower part of the jejunum, were moderately distended by gas; the upper part of the jejunum and the duodenum were much distended, especially the highest part of the jejunum, which measured 8 to 9 cms. in diameter. The bowels contained practically nothing but gas. The small intestines were everywhere injected, especially in the more distended portions.

Hæmorrhages were found in the mesentery, as had already been observed at the operation. No enlarged lymphatic glands could be found; two small swellings were incised, and found to be hæmatomata. No thrombosis of the mesenteric veins was discovered. When the small intestine was opened, the ileum showed swelling of the follicles, and the most distended part of the jejunum showed a well-marked diphtheritic process, beginning about 7 cms. above the proximal intestinal fistula and reaching about 40 cms. upwards, *i.e.* to about the duodeno-jejunal flexure. The mucous membrane of the stomach showed a few hæmorrhagic erosions. The transverse and sigmoid portions of the colon were full of gas. There was commencing infection in the spleen. The kidneys did not show any macroscopical changes. The liver substance showed multiple infarcts (hæmorrhagic, dark red, depressed patches), making in all about one-twentieth part of the whole liver.

REMARKS.—The case illustrates very well the importance of the principles which have been advanced during the last few years. In the treatment of acute abdominal diseases, early diagnosis is the most important factor; if you can arrive at no definite diagnosis, make yourself in any case clear at once on the point *whether the patient needs operation or not.*

In this case it was no doubt very difficult to make a diagnosis during the first and perhaps the second day, especially for his own medical attendant, who was under the impression that the patient had had a slight attack of appendicitis a year before. He now considered the illness to be of the same nature, and hoped that the attack would subside as it had done on the previous occasion. But there was something new in the clinical picture; even at the doctor's first visit there was to be felt a tender resistance, situated near the umbilicus, immediately underneath the abdominal wall, and the abdomen was already somewhat distended. Although for more than two days the temperature was normal and the frequency of the pulse low, the abdomen swelled continuously, the patient suffered from nausea, and at times the pains were very severe. From the very beginning no flatus was passed, but, on the other hand, there was no vomiting.

The symptoms in this case were undoubtedly less severe than in any other I have previously seen in which there was twisting of the whole or of the greater portion of the mesentery of the small intestine.

On arrival at the hospital his general condition was remarkably good: temperature, 38°; pulse, 92; no albumin in the urine, no leucocytosis, no feeling of sickness, and hardly any pain. Against these symptoms there was: high tension in the abdominal cavity, considerable tenderness around the umbilicus without any palpable resistance, and some slight tenderness over the whole of the small intestine. Appendicitis having with some degree of certainty been excluded, one was inclined to think of volvulus of the small intestine, considering the resistance at the umbilicus which had been observed from the beginning of the illness, and the marked tenderness even on the slightest pressure now present over the same spot; one thought also of a Meckel's diverticulum, which had become twisted and shut off from the bowel.

After opening the abdomen, a miserable picture presented itself, strongly contrasting with the "good general condition" of the patient. There was blood-stained, turbid fluid in the peritoneal cavity; the small intestines were bright red, were very greatly distended, and protruded through the abdominal incision. Even after enterostomy and "milking," they could not be returned to the abdominal cavity, but the whole wound had to be left open and the intestines covered with a sheet of indiarubber. During the operation no contractions were observed in the bowel which had been twisted.

It appeared to me that the explanation of the absence of vomiting before the operation might have been that the twist at the duodeno-jejunal flexure was not sufficiently tight to prevent the duodenum and stomach emptying their contents into the jejunum, until the pressure within the bowel had become too great. From the beginning of the attack the patient had taken nothing, not even water.

Every time a patient shows the clinical picture called ileus, the physician must try at once to find the cause. The previous history must be disclosed in its minutest details, and the condition of the abdomen carefully examined. The symptoms may be so plain that at once it becomes evident that one has to deal with a case of twisting of, for instance, the sigmoid flexure, or of an ovarian cyst. Excepting the incarceration of an external hernia, the symptoms are seldom so plain as in the above-named examples. In most cases one has to determine in the first instance the presence or absence of any one of the inflammatory diseases of the abdomen which by local or general peritonitis may cause "pseudo-ileus." Here we have to think of appendicitis, cholecystitis or acute pancreatitis, of a gastric or duodenal ulcer on the point of perforation or already perforated, of pyo-salpinx, etc. In those cases which begin subacutely and without temperature, the most important point to think of is the presence of adhesions in connection either with a previous attack of one of the above-named inflammatory diseases, or in connection with a hernia or a previous laparotomy. The importance of the previous history in these cases is obvious. Of no less importance is the history in other cases of subacute ileus (chronic ileus), in order that we may arrive at a well-founded suspicion or certainty as regards the presence of a growth of the intestine, tuberculous or other stricture or congenital or acquired malpositions of the intestines, all of them conditions which either slowly and perceptibly to the patient, or suddenly and unexpectedly, may lead to occlusion of the intestine.

If it be impossible to arrive at a quick and definite diagnosis by the aid of the previous history and present condition, a diagnosis *ex adjurantibus therapiæ* must at once be resorted to. If you are certain to do no damage by these measures, you may give gastric and intestinal irrigations in quick succession. F. Léjahrs claims to have found great benefit from the electric enema.[1]

If by these means the physician during the course of one to three hours cannot secure a free escape of flatus per anum, the patient should be transferred to a surgical hospital, where in the meantime everything is got ready for operation. Should the diagnosis be still uncertain, or there is not sufficient indication for an immediate operation, another attempt may be made to give relief by gastric and rectal injections under the control of the surgeon. If the desired result be not obtained, operation is then resorted to without delay.

The practitioner must understand that it is his duty to hand over to the surgeon a patient with an inflammatory or mechanical obstruction before that part of the bowel lying above the obstruction is damaged by *distension and by the accumulation of intestinal poisons and bacteria.* I said *inflammatory or mechanical obstruction* to the passage of the intestinal contents. I want to call attention to the fact that paralysis of a portion of a coil of intestine due to peritonitis causes, as long as the paralysis lasts, just as insurmountable an obstruction to the onward flow of the intestinal contents as, for instance, a volvulus of the bowel.

If we now think of our patient with the volvulus of the small intestine associated with a Meckel's diverticulum, the previous history pointed to appendicitis, whereas the superficial and tender resistance at the umbilicus spoke against this diagnosis. It was also remarkable, as I have already stated, that in presence of this resistance and a perfectly afebrile condition, the abdomen became more and more distended, the patient suffered from nausea and eructations, and no flatus was passed by the anus. In my opinion, this patient should have been sent to a surgical hospital during the first afternoon, 8th January, as a case of mechanical obstruction of the bowels. If the patient and the doctor had been doubtful on the 8th of January, careful, repeated irrigation of the stomach and of the colon would no doubt have convinced both of the presence of a "stop" somewhere. All medical men with practical experience agree that in a case of volvulus of the small intestine it is possible at the beginning of the illness, before there is paresis of the afferent portion of bowel, to empty the bowel above as well as below the obstruction fairly well by means of gastric and intestinal irrigation.

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[1] F. Léjahrs, "Technik dringlicher Operationen," 1906, Aufl. 3, S. 161.

What we aim at is the *free passage of gases per rectum with collapse of the distended abdomen.*

It is lucky for the patient if a mechanical obstruction gives marked symptoms at the outset. His medical attendant ought then to be able to see that the case must go to the surgeon, and that there is no time either for doubt or delay. If, on the other hand, the symptoms of obstruction are ill-marked (*i.e.* the pains are slight, the abdomen distends slowly, and flatus is passed per rectum at intervals), then there is danger of the operation being delayed too long. Such conditions are often found during the after-treatment of cases of laparotomy; paretic bowel becomes adherent; some time elapses before it comes to a full stoppage; as long as possible it is hoped that everything will come right. When at last a second laparotomy is made, the picture is a very distressing one: distended, friable intestines and recent peritonitis taking its origin from the obstruction. "It was too late." Had it been possible at an earlier period to come to the conclusion that an obstruction was present, that there was a "full stop," and that only a second operation could give relief, one would, at the second laparotomy, find an adherent bowel which had been kinked, and that the distended coils of intestine above would have emptied themselves either at once, as soon as the adhesion had been separated, or after relief of the intestinal distension, by means of enterotomy, which might at once have been converted into an enterostomy if the intestine had not regained its power of contraction while the patient was on the table.

In all cases where the symptoms of ileus appear subacutely, with intervals, and of varying intensity, there is danger that the operation will be delayed too long, and that in spite of it the patient will ultimately die of stercoræmia. When there is fæcal vomiting, it is almost impossible to save the life of the patient. The body can stand a certain amount of fæcal poisoning —how much? how long? no one knows. Certain it is that the fæcal poisons are not the same in all cases. It is probable that in many cases not only toxins but also bacteria pass early into the blood and lymphatic systems. Our patients therefore have every right to expect us to do our utmost to arrive quickly at a definite diagnosis, or at least to make sure whether an operation is needed at once or not.

The case of volvulus of the small intestine now under discussion would probably have recovered if the duodenum and the adjacent portion of the jejunum had at once been able to empty their contents through the opening made in the small intestine 50 cm. below the duodeno-jejunal flexure. At the autopsy "a well-marked diphtheritic process" was found, commencing 7 cm. above this opening, and extending from thence to the duodenum.

When making a fistula in the small intestine there is a danger of the bowel kinking on one or other side of it. To prevent this, the bowel immediately above and below the fistula should be stitched to the parietal peritoneum. In this case, it was evident from the beginning that the intestine could not be obstructed immediately below the higher of the two fistulæ, as fluid injected into this one escaped by way of the more distally placed one.

During the whole after-treatment nothing escaped through the upper fistula. During the first day and a half feculent matter collected incessantly in the stomach in spite of repeated irrigations. It was thus evident that the stomach and duodenum could not empty their contents into the jejunum. This condition might be due either to the jejunum being kinked above the upper fistula or the duodenum, and the above-named portion of jejunum being still paralysed, in spite of the other parts of the bowel having regained their power of contraction.

At the time when the gastrostomy was performed it was of no special importance to determine this point; it has been mentioned that the bowel was found to be distended and paralysed at the first operation. The increase in the distension during the next day and a half made it perfectly certain that it was paralysed at that time. Our object, therefore, was to provide for the escape of the bile and the pancreatic juice by making a fistula in the pyloric portion of the stomach. This was carried out at 2 P.M. on the 12th by Witzel's method, and after twenty-four hours the fluid which escaped from it was no longer bad-smelling, so that by this time the duodenum, and in all probability also the jejunum, had completely emptied themselves. After another ten hours nothing escaped from the gastric fistula, proving that the stomach, duodenum, and jejunum were able to empty their contents into the intestine below. Thus it was evident that the jejunum could not be kinked above the higher of the two intestinal fistulæ, a fact that was also confirmed at the autopsy. It was then found that the first 40 cms. of the jejunum had a diameter of 8 to 9 cms., and showed a "well-marked diphtheritic process." The distended, paralysed bowel had fallen an easy victim to the poisons and bacteria within its lumen. The result would probably have been different if at the operation on 10th January I had made a gastric fistula instead of a jejunostomy. It was also found at the autopsy that the opening of the tube in the jejunal fistula was blocked by a swollen valvula Kerckringii. This explains why nothing flowed back through the tube when intestinal injections were made, and it teaches us that a fistula tube in the jejunum should reach at least 2 cms. into the lumen of the bowel, and have at least three holes at the intestinal end. The fact that the fluid injected through the jejunal fistula on the first day passed out through the fistula in the ileum, shows that the jejunum nearest the fistula soon regained its power of contraction, whereas the lower part of the duodenum and the uppermost portion of the jejunum remained paralysed about thirty hours after making the gastrostomy.

I consider that the cause of death in this case was diphtheritis of the intestine and toxaemia.

It is probable that the illness from which the patient suffered during April and May 1905 was an inflammation of Meckel's diverticulum, and not appendicitis. The diverticulum was now enlarged in its umbilical portion to a so-called entero-cystoma, filled with pus and faeces, and showing ulceration of its mucous membrane. As a result of the twisting of the small intestine, the healthy dilated portion of the diverticulum also became twisted, and thereby its contents were shut off from the rest of the intestinal canal. As the whole of the anterior surface of the cyst was adherent to the anterior abdominal wall, behind and to the right of the umbilicus, a quite superficial tender resistance could be felt already, a few hours after the onset of the attack. The tenderness, on pressure, increased both as regards intensity and extent, and at the operation an abundant extra-peritoneal œdema was found.

In this case, the colon and meso-colon to the right of the middle line had never become fixed to the posterior abdominal wall, but the colon, together with the caecum and the small intestine, was attached to a mesentery, which was quite free, and hung down from the bodies of the vertebrae, common to both small and large intestines.

This congenital malformation accounts for, on the one hand, invagination of the ileum, caecum, and colon; on the other hand, volvulus of a smaller or greater portion of the small intestine, together with the caecum and the right colon. How easily such a twisting may occur is shown by this case, where, during the untwisting and emptying of the small intestine, the caecum and ascending colon had become twisted a whole turn. In my opinion, a typhlostomy in the anterior taenia of the caecum would be an easy and effective way of preventing a recurrence of the twisting. Besides this, my intention with this oblique fistula was (1) to facilitate the emptying of the ileum, and (2) to allow the introduction of water and nourishment after the operation, until the small intestine had regained its contractile power.

I have previously pointed out[1] that if paralysed intestine, even after being partially emptied of its contents, cannot be replaced in the abdominal cavity, the best plan is to keep the wound open, and to leave those coils of intestines outside. I did so in this case; next to the intestine I placed a smooth rubber sheet, fastened by means of catgut sutures to the edges of the parietal peritoneum. Outside the rubber was put a large sterile, absorbent dressing, fastened to the abdominal wall by means of broad pieces of strapping, and outside of this a thick layer of sterile, non-absorbent cotton-wool to keep the abdomen warm. That under such conditions a commencing, general peritonitis can be cured, is best shown by the necropsy in this case. The peritoneal secretion escapes between the smooth rubber sheet and the edges of the abdominal wound. The adhesions formed between the coils of intestine lying outside the abdominal cavity are much more easily separated than if the bowels are covered with gauze. The intestines lying underneath the rubber sheet sink back into the abdominal cavity as the bowel inside regains its power of contraction, and by emptying its contents becomes less bulky.

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[1] See, for instance, my introductory paper to the discussion on Acute Peritonitis, at the International Surgical Congress at Bruxelles, 1905. *Edin. Med. Journ.*, 1905, vol. xviii. pp. 105, 237.

I may remark in passing that I now only tampon the abdominal cavity in cases where I consider it necessary to isolate a small portion of the abdominal cavity. In these cases I tampon with coarse 3-spun cotton thread. For drainage of the peritoneal cavity I use a thin, smooth rubber sheet, sometimes alone, and sometimes along with thin, soft rubber tubes.

If I resume what I have learned from this case, and from a case of acute dilatation of the stomach, together with volvulus of the ileum and the lower part of the jejunum, lately published by me,[1] my conclusions would be expressed as follows:—

1. If the stomach or the bowel has been distended to a certain degree, *i.e.* if the muscular coat has been stretched beyond a certain limit, these organs are unable to contract until they have been partially emptied. It was shown long ago by Blix that striped muscle does not recover its power of contraction after being stretched beyond a certain point.

2. At the operation the highly distended but not paralysed bowel looks as if it were paralysed, but if emptied of a part of its contents by means of enterotomy, it soon begins to contract, and is afterwards able to empty the rest of its contents through a fistula.

3. Paralysed bowel does not again contract, even after having been emptied of its contents.

4. If one wishes to bring about the recovery of a paralysed portion of intestine by means of enterostomy, the fistula must be placed above the paralysed part of the intestine.

5. As in many cases the paralysis also includes the uppermost portion of the jejunum, and probably also the duodenum below the papilla of Vater, there is in these cases no other way than to make a fistula (gastrostomy) in the pyloric portion of the stomach.

6. If at an operation I have emptied the contents of the small intestine, and in spite of this the jejunum shows no signs of contraction, I at once perform gastrostomy.

7. If, in a case where no indication for primary gastrostomy is found, the size of the abdomen increases, the frequency of the pulse rises or remains high, and two or three irrigations of the

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[1] *Nord. Tidskr. f. Terapi*, Kjobenhavn, 1905, May.

stomach show retention of foul-smelling or stagnant fluid, then there should be no delay in performing gastrostomy.

We have acted on these principles during the last six months, and in view of the results obtained, and which I hope soon to have an opportunity of publishing, I look a little more hopefully on paralysis of the intestine than I did last year. In a previous article[1] I insisted upon the necessity of the patient being subjected to operation before paralysis of the intestine has developed. Should this prove impossible, we have to provide for the emptying of the intestine by making one or more enterostomies, as was done in the present case.

Although the life of the patient may be saved by the making of fistulæ in the small intestine, all surgeons will agree that they are better avoided, if possible. I am now of the opinion that cases of considerable paresis or paralysis of the intestine may be restored to health by emptying the intestine at the time of operation by enterotomy or colotomy, and reserving typhlostomy or gastrostomy, or both, as may be called for in special cases.

No organs are more suitable for an oblique fistula, made after the method of Witzel, than the cæcum and the stomach. The pyloric portion ought to be chosen, as, according to the investigations by Cannon, the fundus empties itself into the pyloric portion, and this latter through the pylorus into the duodenum. The pyloric portion empties itself into a fistula only when the passage through the pylorus is no longer available. This agrees with our experience. As soon as the passage through the small intestine is free (the paralysis of the small intestine having been recovered from), nothing escapes through the gastric fistula, if the patient is not allowed to consume a great quantity of fluid at one time. If an oblique fistula has been made in the cæcum or stomach with a tube of 5 mm. diameter, and the operation has been undertaken at a period of the illness when the walls of these viscera are still relatively healthy, it may always be reckoned upon that the fistula will close as soon as the tube is withdrawn.

The suggestion to deal with the paralysis of the intestine which complicates peritonitis by means of gastrostomy is not new; but, as far as I know, only one case has been published—by Jaboulay[2]—which has been thus treated. F. Léjahrs mentioned it in his introductory paper on acute peritonitis at the International Surgical Congress at Bruxelles, 1905. After having described enterostomy, Léjahrs says: "Let us, lastly, note a case of gastrostomy, made by Jaboulay in order to counteract a severe degree of distension of the stomach, and which greatly relieved respiration and at last restored health. This is a very interesting experiment, which is to be remembered and repeated in those cases where irrigation of the stomach cannot be done or does not suffice."

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[1] *Loc. cit.*

[2] Jaboulay, *Lyon méd.*, 1905, March 12, p. 560.

DARIER'S DISEASE.

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(Plates I. and II.)

Darier, in 1889,[1] was the first to describe accurately the peculiar and fairly rare disease which is the subject of this article. Since then details of some thirty cases have been published, and while the features, and to some extent the localisation, vary in individual instances, there are certain appearances common to all which link them together, so as to furnish a distinct and well-defined picture. In his latest account of the disease,[2] Darier thus observes about it: "It is a chronic dermatosis, characterised clinically by papulo crusts, often follicular, having a fixed regional topography; anatomically by a special disturbance of the keratinisation of the epidermic cells." When a single elementary lesion is examined, the most conspicuous feature is a brownish or yellowish, occasionally a blackish-grey, crust. This is thickest in its centre, and may, indeed, rise to quite a considerable height, even half an inch or more. It is hard, dense, and horny in consistence, and is embedded in a funnel-shaped depression with slightly elevated borders, to which it firmly adheres. When forcibly separated, the cavity disclosed still contains a variable amount of a soft sebaceous-like accretion. The lesions at this stage correspond to the pilo-sebaceous follicles. But Darier points out that there are two varieties of further progress. In one the horny masses grow more than the subjacent papulation, and thus the resulting incrustation may become very extensive. When removed, an irregular reddish and moist surface is exposed, in which the small papular crateriform elements are hardly recognisable. This form is assumed in regions where the follicular system does not attain a great development, as the flanks or limbs. At the extreme margins, however, the typical papules are discoverable. On the other hand, in some exceptional examples the papulation is exaggerated at the expense of the crusting. This constitutes the follicular and vegetating variety, and, as might be anticipated, it reaches its highest development in warm and humid localities, as in the folds of the groin and axillæ. Here somewhat fleshy prominences replace the hard and dry projections. This modification is perhaps rather attributable to situation than to any inherent difference in the disease. But before proceeding to an analysis of the symptoms, it will be best to relate the case which forms the basis for this paper.

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[1] *Ann. de dermat. et de syph.*, Paris, 1889, July.

[2] "La pratique dermatologique," 1901, tome iv.

CASE.—Margaret C., æt. 32, domestic servant, native of Dumfriesshire. With exception of measles in childhood, has had no illness. Though not robust, her constitution is healthy. For six years her work as a servant was very hard, but for three years previous to the commencement of her present ailment she was in an easy place, and had good and abundant food. Her father and mother and one sister are all in good health, and no one of her relatives is similarly affected as herself. She was seen in August by Dr. Norman Walker, and was admitted to my ward on 19th September 1906.

Her scalp has always been scurfy, but the skin disease began three and a half years ago, without any accountable reason, on the left leg and in the sulcus behind the ears almost simultaneously. It next extended to the outer and anterior aspect of the thigh, where now it is worst; then to the right leg in corresponding situations, to the abdomen, chest, and centre of the back. The face and hands exhibit no trace so far. On the forearms are freckles. The hair is plentiful, but the scalp shows thick sebaceous scales, and is dry. The slightest form of the eruption, for which she sought treatment, is seen best at the margins of the affected areas, and consists of a truncated cone the size of a millet seed or less, with a white or yellowish point in its centre. But this is more usually concealed by a pale yellow crust, firmly adherent, sometimes quite thin, but in places reaching an altitude of half an inch. The surface attacked is not uniformly covered with these, but only partially and irregularly. On the front of the left thigh the appearance resembles nothing so closely as one of those contour maps of countries where the mountains are represented in alto-relievo as yellowish-brown ridges. My house-physician, Dr. Hope, compared it not inaptly to a photograph of the moon. On the abdomen some of the crusts have been removed, and a pinkish rough surface is exposed, not exactly warty, nor showing distinctly the minute craters, but hard and dry. On the back, between the scapulæ, the crusts are arranged roughly in lines. One cannot, even with considerable force, wholly remove the crusted accumulations with a Volkmann's spoon. The disease is always at its worst in the centre of an affected area, the lesions are more crowded together; while at the margins they are isolated, less prominent, and manifest their primary papular type. The complaint is steadily aggressive. The finger nails show nothing abnormal; those of the thumbs have each one longitudinal dark line or fissure. The toe nails are dry, and raised from their bed at their distal end by masses of epidermic débris. The eruption occasions some itchiness, and is apt to be scratched.

Her blood, examined by Dr. Lovell Gulland, showed a slight eosinophilia, but not over 4 per cent. Her temperature only showed normal variations.

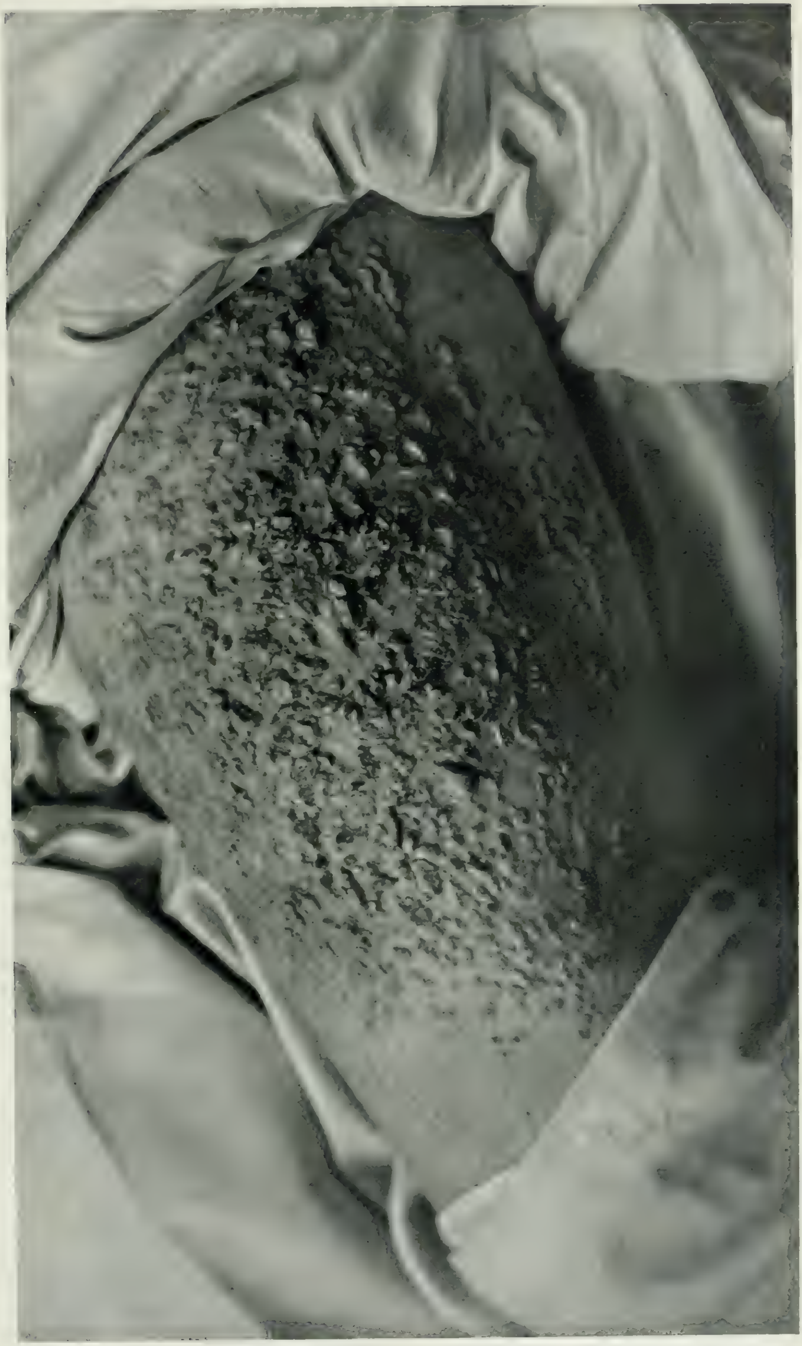
The treatment consisted in poulticing one leg, as a test, with boric starch poultices, to soften the accretions; then to wash, with some degree of friction, with resorcin salicylic soap, and, after drying, to rub in glycerin of starch with 40 grs. of resorcin to the ounce. This thinned down the accumulations, but did not wholly get rid of them, and they tended to reform rapidly.

After I vacated the ward all the lesions became impetiginised—the vaseline was incriminated—and for this ammoniated mercury ointment was applied successfully, so that when seen on 3rd November this had wholly disappeared. The thigh had been subjected to the X-rays, was pretty free of accumulations, in places red, granular, and uneven; but other parts which had not been exposed, and simply treated with ammoniated mercury ointment, such as the margins of the axillæ, presented a similar aspect; so that this was not solely due to the irradiations.

Microscopic examination.—A piece of skin embracing two or three elements was removed from the front of the thigh, at the margin of the area shown in Plate II. Fig. 1. This was placed at once in corrosive, and sections were made of it, and stained in various ways, by Dr. Ritchie in the Pathological Department of the Royal Infirmary. The appearances closely corresponded to those figured and described in Darier's original paper. The horny layer was greatly thickened in those places where the diseased condition was present, forming wedge-shaped cones projecting downwards into the epidermis, this broadening either occurring at a hair follicle, or more frequently between, and separating, two papillæ. The horn cells retained traces of their nuclei nearly to the free edge. This stratum showed numerous spaces, some of which contained oval or round independent masses of varying size; some with, others destitute of, a nucleus-like centre; some were mere empty cavities. At the apex of the horny cone were found in largest number the peculiar "round bodies." These differed in structure and position; a few were certainly contained within the cells of the granular layer, and possessed a nucleus which was either central or displaced to one side. The contents were now studded with fine granular specks, or were hyaline and transparent. They were at this stage bounded by a wall or investing capsule, which showed in many instances a double contour. While most closely packed at the angle of the depression, they were seen also at the sides, and within the rete mucosum. All these characters are clearly visible in Plate II. Fig. 1, and more highly magnified in Fig. 2.

In the mucous layer the interpapillary ridges were markedly increased in extent, both bulging more superficially and descending more deeply. The granular layer was badly represented at the centre, but formed two or three rows at the sides. The particles of kerato-hyaline were plentiful, but were apt to be chiefly distributed at the extremities of the cells. In the deeper cells of the rete the uniting protoplasmic threads were either ill-defined or not traceable. There was no œdema of the lymph spaces. The cells of the basic layer were apparently normal, nor could there be seen any invading leucocytes. In the corium there was slight vascular dilatation of the vessels in its upper part, combined with a degree of emigration of white cells in the immediate neighbourhood. The sweat coils showed no alteration.

Darier and others who have dealt with the histology of this disease speak of "round bodies" and of "grains." The former are those which still exhibit more or less trace of structure, such as the presence of a nucleus, sometimes of a nucleolus. The "grains" are those structureless formations noticeable within the substance of the corneous layer, and which certainly may be aptly compared



Dr. W. Allan Jamieson's case of Darier's Disease.

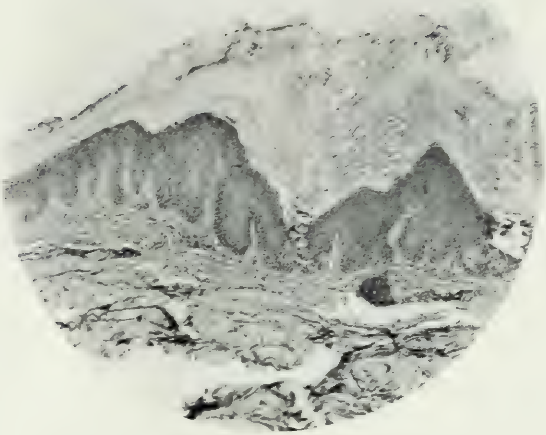


Fig. 1.

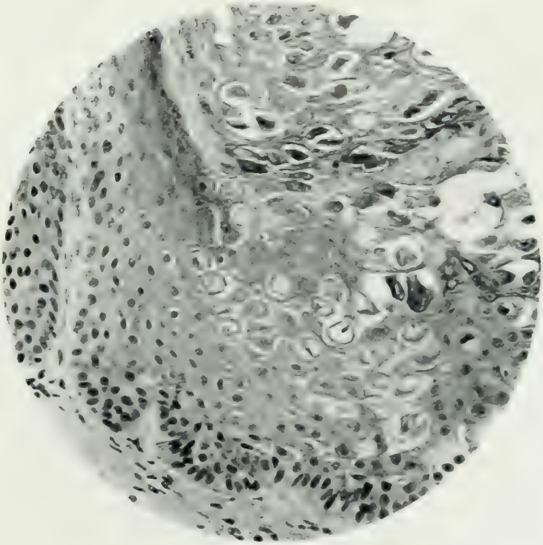


Fig. 2.

to grains of wheat or of barley. Objects having considerable similarity to the "round bodies," yet not identical, are met with in Paget's disease of the nipple. The so-called molluscum bodies in molluscum contagiosum, also modifications of cornification, simulate them still less. In Darier's disease the alteration of cornification, which produces them, seems to commence about the middle of the mucous layer, shown by the change in the spongioplasm of the prickle cells, reaches its height at and just beyond the granular layer, and advances to its final stage within the corneous layer. It is an intracellular process at first, but the degenerated masses lie eventually free in intercellular spaces.

The instance above is quite a typical, and at the same time an aggravated, example of Darier's first division. There were no vegetative phenomena. The aggressiveness of the complaint is one of its most marked features—a steady invasion of new regions, without any tendency on the part of the old to heal. It arises mainly in the young, but this is not an essential characteristic. The appellation originally attached to it—psorospermosis follicularis vegetans—was wholly inappropriate. The "round bodies" bear but a shallow resemblance to coccidia, and fail to respond to cultural or other tests. It is not limited to the follicular system, and the development of vegetations or soft cauliflower-like excrescences is an accident of locality. As to its cause, nothing has been discovered. It has analogical relations with ichthyosis hystrix, with naevus linearis, and in distribution, according to Kreibich,[1] with zoster. The differences, however, are cardinal. Audry and Dalous,[2] in a case recorded by them, found a diminution of the quantity of sulphuric acid eliminated by the urine, the amount being reduced to the lowest limit met with, according to Vogel and Yvon, in healthy adults. Sulphur is a normal constituent of keratin, and is excreted by the skin. There may, therefore, be some association between the decrease in sulphur voided and the abnormal keratinisation met with in Darier's disease. Unfortunately, I was not aware of these observations during the period the patient was under my care. It is most probably due to a central cause: its steady aggressiveness and the absence of any proof of contagiousness favour this view. It must be regarded as a disease *sui generis*. Audry and Dalous remark that "the 'round bodies' are not in themselves specific, but provisionally one must admit that in its totality the disease is boldly differentiated."

In treatment, nothing, so far, has been accomplished save to temporarily ameliorate. The X-rays have been proved to effect the rapid disappearance of the lesions of molluscum contagiosum. It is not unlikely that their influence may be beneficial in Darier's disease.

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[1] *Arch. f. Dermat. u. Syph.*, Wien, 1906.

[2] *Journ. d. mal. cutan. et syph.*, Paris, 1904.

There are three admirable coloured representations accessible In Fasciculus viii. of the "International Atlas of Rare Skin Diseases," Darier gives a picture of his case. The lesions in this instance are more brown than yellow, and more discrete than generally occurs. Schweninger and Buzzi, in the same part, depict the distribution of the disease more fully than the details. In "La pratique dermatologique," vol. iv., Darier has a well-executed plate. In colour it closely corresponds to my case, and the vegetative phenomena are exhibited, as well as the minute truncated cones with central crater, so characteristic. There are likewise some good studies in black and white, as in Piffard's Atlas, and in conjunction with the papers of Ormerod and MacLeod in the *Brit. Journ. Dermat.*, London, 1904, and of Audry and Dalous, already referred to.

DESCRIPTION OF THE PLATES.

PLATE I.

Photograph of the front of the left thigh of the patient, where the lesions were most pronounced.

PLATE II.

FIG. 1.—General view of the diseased portion of skin. At the upper part the thick wedge of overgrown corneous layer, with the spaces between the flattened cells, some vacant, others containing "grains," can be seen. At the apex of the wedge the "round bodies" are visible within the apertures. The great hypertrophy of the rete mucosum, and the dilatation of the vessels in the papillæ and upper part of the corium, can also be made out. (× 45 diam.)

FIG. 2.—The "round bodies," in various stages, are seen in the centre. The "grains" lying in spaces between the horny cells are noticeable at the upper part of the micro-photograph. (× 200 diam.) (Photographed by Mr. Richard Muir.)

THE MANAGEMENT OF SOME DIFFICULT OCCIPITO-POSTERIOR CASES.

By J. LAMOND LACKIE, M.D., F.R.C.P.Ed., *Assistant Physician, Royal Maternity Hospital; Lecturer on Obstetrics and Gynæcology, School of Medicine of the Royal Colleges.*

UNTIL quite recently I had been in the habit of thinking, and indeed sometimes of teaching, that when the obstetric forceps slipped off the head during the operation of extraction, the instrument had been unskilfully applied. Within the last month I have changed my views on this point entirely. Up till October of this year I had no personal experience of the accident, but during that month I had two consecutive cases in which the forceps slipped, and these form the basis of the present communication.

CASE 1.—Mrs. D., æt. 29, primipara, went into labour on Thursday, 4th October, at 2 A.M. The pains at first were slight and very occasional, but the membranes ruptured at 10 A.M., and at 11 A.M., when I first saw her, the os was only the size of a shilling. It dilated very slowly, and little progress was made all Friday. During the night the pains were stronger, and at 10 A.M. on Saturday the os was 3 in. in diameter, and a right occipito-posterior position was diagnosed. Pains were strong till 3 P.M., but on examination one found that since 10 A.M. absolutely no progress had been made, and the anterior segment of the cervix had become œdematous. At 4 P.M. the patient was exhausted, and inertia uteri had set in. Chloroform was administered, and the dilatation of the os completed by the fingers. Forceps were then applied to the head, which was well engaged in the pelvic inlet. Strong traction seemed to make no impression, and suddenly, during an extra effort on my part, the forceps came away in my hands. The sensation, to say the least of it, was unpleasant; one felt that one had fractured or dislocated something, but I take it that the click one feels and hears is simply due to the sudden excessive overriding of the cranial bones which the closed forceps causes as the instrument comes over the head. Fortunately, the damage to the mother's soft parts was slight, but the vulva was somewhat torn by the escaping forceps. I then tried to flex the head and rotate it, but, as I almost expected, my efforts were fruitless, as the head was too high up and too fixed. Forceps were again applied, and appreciating the fact that the occiput was to the back, I endeavoured to apply the blades in that region. Again the forceps slipped when I pulled, and this not once but several times. The instrument was not each time forcibly pulled out of the vagina, as I was always on the outlook for slipping. Here, I may say, that by grasping the application handles, as well as the traction handle, I was better able to appreciate whether the blades were to slip or not; one seemed to be more in sympathy with the position of the blades by sensation conveyed through the handles than through the traction rods. Ultimately, one seemed to find a grip that held, well back over the occiput, and the head was born face to pubis but only with great difficulty, and after the expenditure of much force in traction. There was some laceration of the perinæum. The child, a female, which weighed 9 lb., was apnœic but recovered, though it showed signs of compression for two or three days. It is now very well, but has a marked internal strabismus of the right eye, which, however, is now improving. The mother had a normal puerperium. I ought to mention that she was a woman of average stature, and there were no obvious signs of any deformity of the pelvis. This, then, was simply a persistent occipito-posterior case, delivered in the usual way by forceps—the only peculiarity being the slipping of the forceps, which shows how excessive was the traction necessary for delivery. I have quoted the case as a contrast to the two which follow.

CASE 2.—Mrs. W., æt. 30, 2-para, expected her confinement on 10th October, but this did not take place till 28th October. Pains commenced at 2 A.M.; at 4 A.M., when I saw her, the os was nearly but not quite fully dilated. Right occipito-posterior was the position. At 5 A.M. the membranes ruptured and the liquor amnii began to trickle away. The cervix was still not fully taken up. At 8.30 A.M. there was no change, except that the anterior segment of the cervix had become œdematous. Pains were now slight, and made no impression on the advance of the head, which remained at the brim. Under chloroform, forceps were applied, and, to my surprise, I repeated my experience of 6th October. The forceps came away in my hands with, fortunately, no damage to the mother. I reapplied them, still remembering the position of R.O.P., but the result was the same, and no matter how carefully I applied the instrument well back towards the promontory of the sacrum, the forceps, whenever traction of any degree was employed, came over the head with that click which is so suggestive of serious injury to the child. I applied the forceps no less than six times, but I could not get the head to enter the pelvis. I then tried to turn the child's head round so that the occiput should be to the front, and at the same time I endeavoured to turn the shoulders by external manipulation, but though I could move the head I could not turn the shoulders, and before I could get the forceps applied the head was back to its original position. Finally, I introduced my hand past the head and with two fingers on the right shoulder and my left hand acting through the abdominal wall, with great ease I turned the child round till it occupied the L.O.A. position. Once more I applied the forceps, and with comparatively little traction the child was born within three minutes. It weighed 10½ lb., but seemed to have suffered no injury except facial paralysis, which passed off in three days. The mother had a normal puerperium. She was a woman of medium height, and had no pelvic deformity. I delivered her of her first child exactly four years previously, when the labour was almost normal, forceps being applied only to bring the head over the perinæum.

Case 3.—I hoped I had done with difficult R.O.P. cases for the month, but I was mistaken. On Tuesday, 30th October, at 10 A.M., I was called to Mrs. B., 3-para, who had been in labour since 4 A.M. The os was the size of half a crown. At 3 P.M. the liquor amnii began to trickle away. At 5 P.M. the os was nearly, but not fully, dilated; the position was R.O.P., and the head was high up and movable at the brim. At 9 P.M. there was no change, and inertia uteri had set in. The patient was chloroformed, and first of all I applied forceps, but the locking was so unsatisfactory that I was not surprised that traction proved useless, and I therefore soon desisted. Remembering my experience of two days before (Case 2), I determined to try internal rotation of the head. I removed the forceps, then pushed the head upwards and by internal and external manipulation turned the head round till the vertex lay in the R.O.A. position. A pain came on and fixed it there, and as rapidly as possible I applied the forceps. Extraction was quite easy, and a living child was born, 9 lb. in weight, with no signs of damage at all. The interesting point about this case was that the patient had been confined twice before, nine years ago and seven years ago, and on both occasions she was very ill, instruments were used, and both children were born dead, having died, the mother tells me, during birth. I cannot help thinking that but for artificial internal rotation the result would have been just the same on this occasion.

The first and the second and third cases which I have narrated form a striking contrast. The first was a primipara who presented all the usual features of a malposition of the head—a slow first stage, premature rupture of the membranes, and œdema of the anterior segment of the cervix, which one notes seems in these cases always to hang free in the pelvis between the head and the outlet. The second stage was delayed, the descent of the head was only partial, spontaneous rotation did not occur, the forceps slipped several times, but ultimately the patient was delivered simply by excessive forceps traction. Had forceps failed, one had to think of craniotomy, symphysiotomy, or pubiotomy. The second and third cases presented the same preliminary feature as Case 1, but the head was still movable at the brim. There were several possibilities of treatment had forceps ultimately failed—Cæsarean section, embryulcia, etc.—but the whole object of this paper is to emphasise the fact that to rectify a malposition if diagnosed early is possible and sometimes easy. I have rarely been so struck with the effect of treatment as in the second case, where what proved almost an intractable case became quite suddenly, by simply rotating the child, one of the easiest high forceps cases I have ever experienced. The child was large, it was post-mature, but once it was placed in a normal position it was delivered in a very few minutes. Before resorting to a more serious obstetric operation, such as craniotomy, I should certainly have performed internal version, which is generally recommended in these cases, but the chances for the child would then have been much diminished. Everything was no doubt favourable for artificial rotation: the head was still not properly engaged, the liquor amnii had not all escaped, and the patients were multiparæ. Since in nine cases out of ten an R.O.P. rotates so that the occiput comes forward, one would not attempt this operation if the head were descending with the pains, one would simply *further* rotation chiefly by increasing flexion. In all text-books reference is made to artificial rotation of the head when it has reached the pelvic floor, and this is common practice, but only in a few, and these are foreign, is rotation when the head is high up recommended as a possible method of treatment. I am not sure that in this country the value of artificial rotation of the whole child when the head refuses to enter the pelvis has been duly appreciated. Under the circumstances which prevailed in Cases 2 and 3, I should be inclined, if an R.O.P. were diagnosed early, to again try artificial rotation, rather than risk a very difficult forceps case, a possible sacrifice of the child by version or a certain one by embryotomy.

PAROXYSMAL TACHYCARDIA.

By JOHN HAY, M.D., M.R.C.P., *Physician, Stanley Hospital; Physician, Hospital for Consumption and Diseases of the Chest, Liverpool.*

TACHYCARDIA, or much increased frequency of the heart beat, is a not uncommon condition, and is induced by many causes, the chief being a diminution of the normal inhibitory influences. Pyrexia, the toxæmia present in diphtheria, in some cases of tuberculosis, and in other infective conditions, probably act in this manner; also alcohol, atropine, and thyroid. Increased frequency may also be the response to stimulation of the accelerator fibres, or even to direct irritation of the heart muscle. Symptomatic tachycardia, such as I have mentioned, does not, however, concern us now. Our present objective is one of peculiar and arresting interest—paroxysmal tachycardia. Clifford Allbutt (1), when referring to this variety, would dispense with the term "paroxysmal," for, he says, "tachycardia is a fairly uniform symptom group, and as one of its eminent characteristics is its paroxysmal occurrence, the addition of this qualification to the name is superfluous"; but as the term "tachycardia" is now so generally applied to any pulse of much increased frequency, the addition of the descriptive adjective helps to focus attention on the symptom complex under discussion. I have therefore followed the example set by Bouveret, and retained the term "paroxysmal." I have decided to confine my attention to three cases illustrating the points I desire to make.

The first and most typical is a patient under the care of Sir James Barr, and it is through his kindness that I am able to refer to the records of the case and to make use of observations and tracings taken by myself during the last few years. Sir James Barr has already published the case as a clinical lecture in the *British Medical Journal* (2), and I refer my readers to that record for a more detailed account of the history than space permits me here.

CASE 1.—The patient, a youth, æt. 19, has suffered since 21st September 1903 from sudden attacks of greatly accelerated heart activity. In all, he has had sixteen paroxysms.[1] The first occurred during a period of perfect health, and the same can be said of the later attacks. In many of these, no factor could be assigned as an exciting cause; on the other hand, on at least six occasions there is a definite history of physical strain. The first paroxysm came on after a game of football, in which he received a severe blow over the epigastrium and lower end of the sternum. The stress of football was responsible for the second attack; carrying timber, running to escape from the police, straining under a heavy sack of flour, and smart walking have all in their turn been the apparent cause of a paroxysm.

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[1] Since writing this account of the case in the autumn of 1905, the patient has had several similar attacks of tachycardia.

The tachycardia is of varying duration. The paroxysm has lasted from some hours to as many as eight days. The onset is usually sudden, and on several occasions has been accompanied with vomiting. During the paroxysm the patient is somewhat livid and of an ashen grey tint. His "area of cardiac response" is limited, and he prefers to be in bed. The pulse rate varies from 160 to 300 per minute, the more usual frequency being a little over 200. Frequently the force of the heart's contraction was alternately weak and strong, giving rise to an alternating pulse (see Figs. 10, 11), and as, in addition to this, a paradoxical variation was often observed, it was generally necessary to use the stethoscope in counting the frequency of the heart beat. I always found the heart acting with perfect regularity as to time, though often alternating in force.

During the first twelve paroxysms the patient was conscious of a throbbing in the neck and a fluttering and trembling sensation about the region of the heart. Associated with this there was marked hyperæsthesia over the præcordium and also over the liver area. The hyperæsthesia was not only present in the skin, but also in the muscles underlying it. Gently pinching the sternomastoids and trapezii, especially those on the left side, caused an appreciable feeling of pain. Latterly this has been absent.

During a paroxysm, the veins of the neck are greatly distended and pulsate forcibly. The heart soon after the onset of an attack is markedly dilated, and extends three or more inches to the right; rarely more than four inches to the left of the midsternal line. The apex beat is diffuse and wanting in definition, and there is some substernal heaving, together with an unusual appearance of flickering over the heart area. The heart sounds are short, sharp, and clear, with a peculiar rhythm, to be described later. On many occasion there were marked signs of back pressure, the liver has been distended and has reached almost to the umbilicus; it pulsated, and the skin and abdominal wall over it were tender. On the occasion of the first paroxysm, fluid collected in the abdominal cavity and was removed by operation.

The patient passes little urine while the paroxysm lasts, largely because his appetite disappears and he eats little and drinks less. His sleep is, as a rule, unaffected by the paroxysm, and the tachycardia continues during sleep. His breath has a peculiar odour, and there is a tendency to constipation; when the heart action becomes normal, the peculiar odour of the breath and the constipation pass away.

The termination of the attack sometimes occurred quietly, occasionally during sleep; at other times, on the contrary, it was dramatic in its suddenness. Within two minutes the pulse rate would drop from 200 to 60 per minute.

The patient has observed that when an attack ceases in this sudden manner, his distress is much greater than when the pulse slows down more gradually. When the paroxysm terminates abruptly, he is seized with great pain behind the sternum; the character of the pain is gripping and crushing; it works its way up the chest and into the neck, and he experiences a sensation of impending death. He feels as if the heart was working against an overpowering resistance. It appears to him to thump wildly against his chest wall. At the same time, the "arms feel dead," especially the left on its inner side. He writhes in bed, grunting and groaning with agony.

Sir James Barr and I were present at the termination of an attack on 12th October 1905. The whole transition took place in less than five minutes, and was of a milder nature than that described above. Several tracings, taken immediately before the drop in the pulse rate, demonstrated a large and forcible venous pulse, and a radial pulse of 160 per minute, alternating and paradoxical. Sir James Barr examined the patient, forcibly slapped the præcordium, and then ordered him to breathe deeply. This he did some twenty times or more. He then began to writhe in bed, and complained of pain behind the upper portion of the sternum. He rubbed his face because of peculiar "dithering" sensations in the skin of the cheeks, and stated that he felt a little suffocated. In the course of this train of symptoms, the pulse frequency dropped to 80 per minute. The pulse at the wrist was very weak and feeble, and neither alternating nor paradoxical. The throbbing in the neck completely disappeared, and I failed entirely to obtain any record from the jugular vein immediately after the cessation of the paroxysm.

His condition at present is much more stable than at first, and in his opinion the attacks are less distressing in character and less easily induced.

The second case is that of a rather delicate child of 6, who, for twelve months before the onset of the tachycardia appeared to be more nervous and less active than formerly.

Case 2.—I saw the boy on 20th February 1905 in consultation with Dr. Macdonnell, who had been called in a fortnight earlier, on account of an attack of vomiting. He then noticed that the child looked pale, and that the heart's frequency was 230 per minute. There were some moist sounds to be heard in the chest, and the temperature was a little raised. On 20th February the child was pale, of an ashen tint, and well nourished; his extremities were warm, and temperature normal. He refused to remain in bed, and felt quite comfortable. There was some dyspnœa on running about, and he was generally rather listless. He ate and slept well, and would not admit to any unusual sensations about the chest. He sturdily reiterated that he was "all right." His respirations were 28 per minute, and his heart frequency 190, 182, 186, the pulse soft, of medium volume and perfectly regular in time and force. The heart extended ¼ in. to the right of the midsternal line, and 3½ in. to the left. The sounds were pure and similar in quality—short, sharp, and slapping in character. Râles and rhonchi were audible over the whole chest. The most marked feature of the condition was the very pronounced pulsation in the veins of the neck. This patient was therefore suffering from tachycardia and dilatation of the heart in the absence of any valvular disease. Ten days later the tachycardia persisted, and on examining the chest I found an increase in the deep cardiac dulness of ⅜ in. to the right and ½ in. to the left, making a total transverse dulness of 5⅜ in. The liver was also larger. Four days later the child's condition had distinctly improved. He was more lively, and his ears and lips were a better colour. The cough had almost ceased. Coincident with this change in his general health, a distinct difference was noted in his pulse. It was markedly irregular in force and frequency (see Figs. 6, 7, 8). The rate was 120, 110, 130 per minute. This improvement continued, and the pulse steadily slowed down till by 15th March the frequency was 84 per minute, and the cardiac dulness normal (see Fig. 9). The tracings, taken during this period of cardiac arrhythmia, afford us valuable information, and will be referred to in detail later.

This case so lightly sketched does not conform closely to what some are pleased to describe as the "type." It departs from it in two respects—first, the long duration of the attack; second, in its gradual rather than sudden termination. In essence it is, however, an example of "paroxysmal tachycardia," and demonstrates the dilatation of the heart, the distension of the liver, and the pulmonary congestion secondary to this abnormal cardiac state.

The last of the three cases used as a clinical basis for this paper is that of a man, æt. 42, who suffers from mitral stenosis, with slight mitral regurgitation.

I agree with Herringham (³) that no real distinction can be drawn between cases with and without signs of organic lesion, though, as he points out, the latter being the more surprising are probably recorded in greater numbers.

Case 3.—As a rule, this man has a pulse of 40 to 60 to the minute, irregular in force and frequency (Fig. 14). His systolic blood pressure varies from 120 to 130 mm. of mercury. In his case slight stress or excitement may so affect his heart that it suddenly bursts into a frequency of 160 beats per minute, the tachycardia persisting for minutes or hours (Fig. 15). At one time such efforts as washing his face, or even suddenly standing up after sitting, were sufficient to initiate the paroxysm. Again, a paroxysm occasionally occurred in the absence of any recognisable exciting factor. Perfect rest, followed by massage and carefully regulated movements, have greatly diminished, in fact have almost entirely done away with the attacks. With the onset of a paroxysm the jugular veins were observed to pulsate strongly. During the attacks his sensations were simply those of a fluttering and trembling over the praecordium. He experienced no pain, and only slight palpitation.

The conjectures as to the essential cause of the paroxysms are numerous; the actual facts bearing on the pathology are few. It is not to be wondered at that the vagi have been held in some way responsible: they are said to be "paralysed or out of gear," or they "are overborne by excessive action of the accelerators," or they are paralysed and the sympathetic are initiated.

The cardiac ganglia also have received their share of attention, and have been looked upon as the seat of the disorder. Gaskell's (⁴) researches have given that view its quietus. Clifford Allbutt confesses that he "leaves the suggestion of extensive areas of anaemia somewhat wistfully." Hoffmann (5) believes that the essential lesion must be located in the central nervous system, and considers the paroxysm similar in nature to an epileptiform attack.

Wenckebach (6), when discussing Hoffmann's views, suggests that the stimulation of the central nervous system results in a great increase of the chrontropic and bathmotropic influences playing on the heart.

Hoffmann considers that the suddenness of the onset and the suddenness of the cessation of the paroxysm, the pupil changes, the associated migraine attacks, the profuse sweating, the vomiting, the vasomotor appearances, and the increased flow of urine, irrespective of alteration in blood pressure occasionally observed during the paroxysms, are strongly indicative of the nervous origin of the disease. At the same time, he admits that careful microscopical examination of the central nervous system, and also of the vagus and sympathetic nerves, failed in thirteen cases to reveal anything abnormal. He was the first to point out that the heart did not contract normally during the paroxysm, and asserted that the numerous beats were all extra systoles.

Mackenzie (7) has also demonstrated independently that the cardiac rhythm is changed during the paroxysm. He believes that either the auriculo-ventricular fibres or the ventricular muscle itself are responsible for this abnormal rhythm, and he has published numerous and valuable tracings of a case in which, after many attacks, the "ventricular rhythm" finally became persistent. Professor Keith was able to demonstrate in the heart of this patient that there were pathological changes in the fibres of the auriculo-ventricular bundle. The tracings which I publish in this paper strongly support the view of abnormal cardiac contraction as a distinct feature of the paroxysm.

Hoffmann has stated, as we have noted above, that the numerous beats in tachycardia are all extra systoles; in reference to this, Wenckebach points out that it is proved from all sources that it is impossible to set up extra or premature systoles from the nervous system directly, in other words, that extra systoles are autochthonous. There is, however, an undoubted consensus of opinion that nervous influences are at work in these patients, and yet, at the same time, as Herringham (3) points out, the localisation in the heart of any lesion that may exist is rendered probable by a consideration of the exciting cause of an attack.

These statements are apparently in conflict, but careful consideration shows that they can be reconciled. I would suggest that the nervous influences, unable in themselves to excite extra systoles, so alter the condition of the heart muscle and more especially the fibres joining the auricles and ventricles, that they are rendered much more excitable, and also much more capable of stimulus production.

The determining factor of the paroxysm is then some cause which affects these fibres, and initiates the abnormal cardiac action. As we have seen in our cases, and in the records published by others, traumatism or physical stress or strain is the most usual exciting factor, and such would be more likely to affect the heart itself than any portion of the nervous system.

I agree with Sir James Barr (^{2}) in the view that the attacks are frequently initiated by some hyperdistension of the right ventricle, but this in itself is surely not a sufficient explanation; one must also presuppose some instability in the cardiac mechanism, an instability which permits of the inception of an entirely abnormal method of contraction, and I suggest that such a condition of instability is the result of abnormal nervous influences.

Herringham records the result of six post-mortem examinations. In three the only abnormality was dilatation of the heart, in two there was fibrosis of the left ventricle, and in one the myocardium was fatty.

Hoffmann states that in thirteen autopsies myocarditic changes were present in all—these were usually recent. He does not believe that the myocardial condition was responsible for the disease.

In Mackenzie's case, as already mentioned, Professor Keith found the pathological changes in the auriculo-ventricular bundle. The heart was dilated and hypertrophied. Samuel West (^{8}) holds the view that the myocardium is probably involved.

We shall find later that the most efficient methods of treatment have one feature in common, that they tend to alter suddenly the mechanics of the circulation, and so to concentrate their effect on the heart.

The most important characteristic of the paroxysm now falls to be considered in its relation to the pathology of this condition. It is, that during the paroxysm there is an essential and fundamental change in the mode of cardiac contraction, the heart beats in a manner specifically different from that normally found. This I shall now attempt to demonstrate.

Up to this point I have not referred, except in passing, to the many tracings taken from these patients; they have been invaluable in assisting me to understand what occurs in these attacks, and well repay a careful study.

Consideration of the tracings.—The tracings of the radial and venous pulses are obtained simultaneously, and from them we learn certain facts concerning the action of the heart.

Fig. 1 is an example of the auricular type of venous pulse. The wave *a* is caused by the systole of the auricle; it immediately precedes the period representing the sphygmic portion of the ventricular systole, namely, that portion of the tracing included between the two vertical lines and labelled E.

The lever, after recording the wave *a*, is arrested in its descent by the impact of the carotid pulse, and thus is produced the wave *c*. The venous tracing is therefore complicated by the presence of the wave *c* due to the arterial pulse in the carotid; *c* can almost always be located in such a tracing, and thus we have a fixed point from which to work on the analysis of a record.

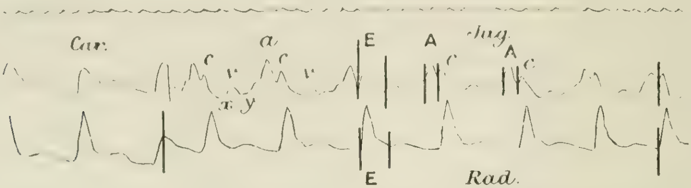


FIG. 1.—Tracing to show the auricular type of venous pulse. The space E indicates in all the tracings the period of ventricular systole during which the semilunar valves are open, the sphygmic period. The wave *a*, preceding the period E, can only be due to the systole of the right auricle. The fall *x* is partly due to the diastole of the auricle causing a rush of blood out of the jugular vein into the auricle, and partly to the change in position of the auriculo-ventricular groove caused by the ventricular systole. The wave *v* represents the resultant of several forces acting during the systole of the right ventricle. The wave *c* is due to the impact of the carotoid pulse. The space A represents the *a c* interval, and indicates the time taken by the stimulus to pass from the auricle to the ventricle. It is normally one-fifth of a second. The time marker records one-fifth of a second. This applies to all the tracings.

The character of the venous pulse alters as the frequency increases. Fig. 2 is taken from a patient with a pulse frequency of 150 per minute, who was suffering from carditis and cardiac failure.

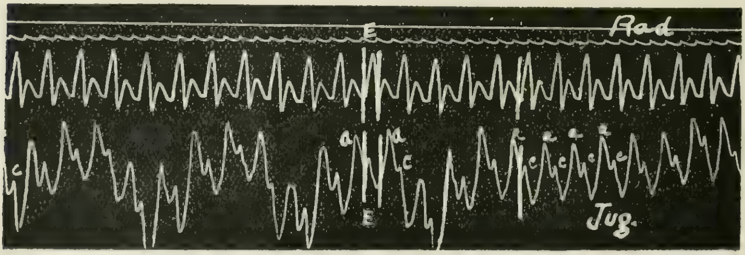


FIG. 2.—Tracing taken from child suffering from carditis; the pulse frequency was about 150 per minute. Note the wave *a* occurring before E. The wave *v* has disappeared with the diminution of diastole. This tracing demonstrates that the auricles contracted before the ventricles, irrespective of the frequency.

In this tracing only two waves are seen, *a* and *c*. The diastole is so much shortened that any trace of *v* is merged into *a*.

In both these tracings we recognise that the auricle has contracted before the ventricle. The justifiable inference is that increased frequency does not in itself change this normal sequence of events.

This same auricular rhythm is also found in the tachycardia of exophthalmic goitre, febrile tachycardia, nervous tachycardia, etc. A few days ago I took some tracings from a woman in fair health, whose pulse rate is usually 160, and whose systolic blood pressure was 155 mm. of mercury; they demonstrated that in her also the systole of the auricle preceded that of the ventricle.

In paroxysmal tachycardia, however, it is not so.

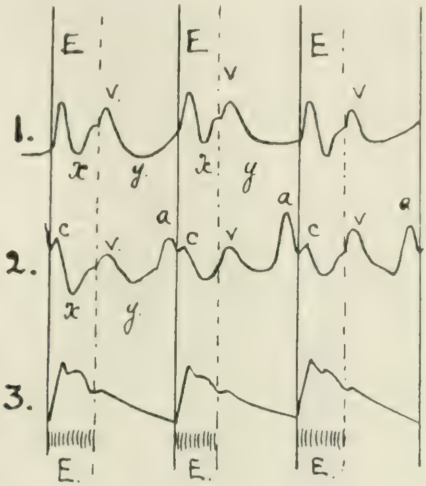


Fig. 3.—Diagram demonstrating the differences between the "ventricular" and the "auricular" venous pulses when the heart is acting tranquilly. 1 is the "ventricular." 2 the "auricular" venous pulse. 3 is a tracing of the radial pulse; in it the sphygmic period is indicated by short upright lines. This period is also shown in both the tracings 1 and 2. In 1 there is no wave *a*; the auricle did not contract before the ventricle. In 2 the wave *a* is constant and well marked. In both 1 and 2 the wave *v* is present, and very similar in character. It is caused in some way by ventricular systole.

Tracings taken during the paroxysm differ entirely from the above.

The first obvious characteristic and difference is the absence of any curve to suggest contraction of the auricle. The venous pulse is of the "ventricular" type, and perfectly regular.

Fig. 3 is a diagram constructed to demonstrate the difference between these two varieties of the venous pulse. The lower tracing is that of the radial pulse, the shaded lines representing the sphygmic period E, that portion of the systole of the ventricle during which the aortic and pulmonary valves are open. The middle tracing is the auricular type of venous pulse, and in it one sees the three typical waves, *a*, *c*, *v*. Here the auricle evidently contracted before the ventricle, and the wave *a* occurs before the sphygmic period E. The upper tracing is of the ventricular type, no wave occurs before the beginning of ventricular systole corresponding to *a* on the middle tracing. The auricle therefore is either paralysed or is contracting at the same time as the ventricle. *V* is well marked, and the small rise, so frequently seen immediately after the period **E**, is clearly shown. This diagram shows the tracings obtained when the frequency is normal: in Fig. 4 we see compared the auricular and ventricular types of venous pulse when the frequency is greatly increased. In this diagram the auricular venous pulse is similar to that found in Fig. 2.

Two varieties of the ventricular venous pulse are shown in Fig. 4, I. and II. Variety I. occurred in Case 1 (see Fig. 10) and also in Case 3 (see Fig. 15). Variety II. occurred in Case 2 (see Fig. 5). In both there is no trace of any systole of the auricle. In I. there is one large wave due to tricuspid regurgitation, the wave begins at the beginning of E, and persists almost up to the next period of ventricular systole. In II. there is a slight rise during E, and then an immediate and sudden wave synchronous with the closure of the aortic and pulmonary valves. This wave is probably a glorified edition of that portion of *v* occurring directly after the period E, as seen in Fig. 3. That there is practically no wave during the sphygmic period of ventricular systole, would point to the non-existence in Case 2 of any but the slightest tricuspid regurgitation.

Fig. 14 is a record obtained from Case 3 between the paroxysms. In this patient the ventricular rhythm persisted irrespective of the paroxysms. Here, as the pulse is infrequent, the analysis is easier. We see that the heart is acting irregularly, and that, preceding the period of ventricular systole E, there is no evidence of any wave due to the systole of the auricle. The persistent and invariable absence of any trace of the wave *a* is presumptive proof that the auricles did not contract before the ventricles; the auricles were therefore either incapable of contracting or they contracted simultaneously with the ventricles. At first this may appear a somewhat wild statement; but Lohmann has demonstrated experimentally that such a condition can occur, and, in fact, we know that the occasional simultaneous contraction of the auricles and ventricles is of everyday occurrence in the commonest form of irregular action of the heart, namely, that of extra systole (9).

Lohmann (10) showed that, after stimulating for a short time the auriculo-ventricular bundle in the unwounded heart of a dog, the normal action of the heart was suddenly replaced by simultaneous contractions of the auricles and ventricles. Synchronous with the inception of this abnormal rhythm, the frequency of the heart's action was greatly increased.

This continued for some time, and in one case persisted till the animal died.

The auricles and ventricles both responded to stimuli served up to them from the auriculo-ventricular bundle. For the time being these stimuli dominated the rhythm of the heart.

As Gaskell has proved, every part of the heart possesses the power to develop a rhythmical stimulus, and he showed that this characteristic is much more pronounced in the more embryonic portions of the heart, such as the fibres at the junction of the

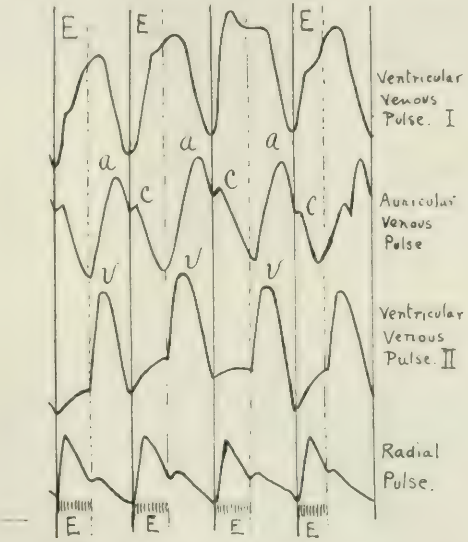


FIG. 4. Diagram demonstrating the two types of "ventricular" venous pulse, and their relationship to the "auricular" type during frequent action of the heart.

At the foot of the diagram is placed the radial pulse for comparison. E is indicated by the vertical lines as in Fig. 3. Venous pulsation similar to the "ventricular venous pulse" I. is seen in Figs. 10 and 15; similar to the ventricular venous pulse II. in Figs. 5 and 10; similar to the auricular venous pulse in Fig. 2. In I. and II. there is no indication of any contraction of the auricles. In I. the wave is an enlarged *v*; it indicates tricuspid regurgitation. In II. the wave begins with the termination of the sphygmic period, and is an exaggeration of the similar but small wave seen in Fig. 3, tracing 2.

sinus and the auricle and the fibres joining the auricles and ventricles. It is obvious that that portion of the heart which originates the most numerous stimuli must dominate the rhythm, the contraction spreading from it over the heart.

Lohmann caused the auriculo-ventricular bundle to serve up stimuli more numerous than those from any other portion of the heart, with the result that they were responsible for the inception of the rhythm, and a wave of contraction passed simultaneously up into the auricles and down into the ventricles. He thus demonstrated a condition in which the fibres joining the auricles to the ventricles initiated the contractions of the heart. Such, I believe, is the condition present in these cases of paroxysmal tachycardia.

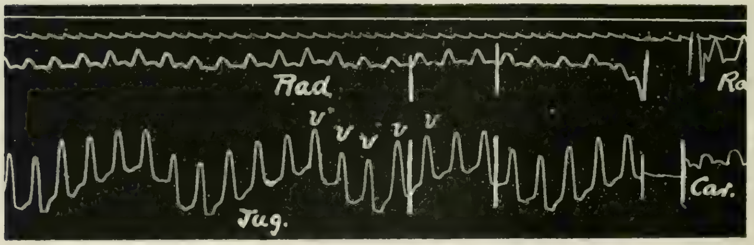


Fig. 5.—Simultaneous tracings of the radial and jugular pulses taken from Case 2 during the paroxysm. The venous pulse belongs to the ventricular type.

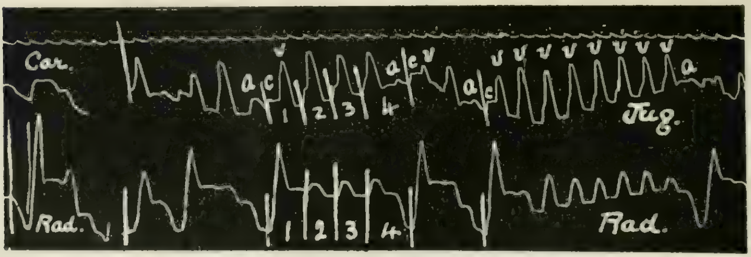


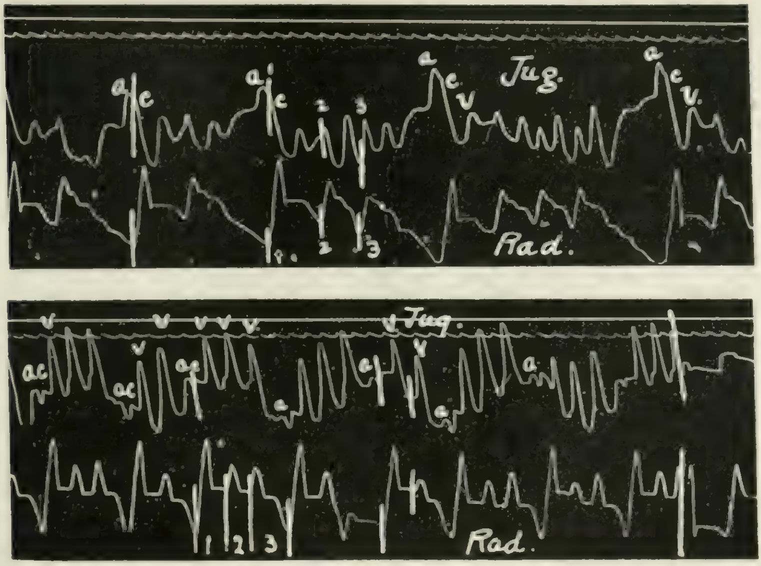
Fig. 6.—Tracing taken from the same patient eleven days later. Note the arrhythmia due to the occasional interpolation of a normal cardiac contraction. When this occurs, the diastole preceding it is longer as at 4 than when the rhythm is ventricular as at 2 and 3.

The evidence for this conclusion is found in the tracings obtained from these cases.

As a rule, the termination of a paroxysm is sudden, or at the most a matter of minutes. In Case 2 the unusual occurred, and the recovery was of a more gradual character. During this period the pulse became irregular, and numerous tracings were obtained, of which Figs. 6, 7, 8 are examples. In them we are able to follow the attempts of the heart to regain its normal rhythm.

Fig. 5 was taken during the paroxysm, and shows that the heart was beating with perfect regularity. There is only one definite wave in the jugular vein during each cardiac cycle, and this wave is represented diagrammatically in Fig. 4, II. There is no sign of auricular systole.

Goteling Vinnis (11) has published a very similar tracing illustrating a case of paroxysmal tachycardia, but his explanation of the tracing is incorrect, because he has omitted to allow for the time taken by the pulse wave to travel from the aorta to the radial artery. One sees at a glance that when allowance is made for this delay, the wave which he has labelled *a* occurs within the period of ventricular systole, and not antecedent to it, as he suggests. He states that the method of the heart's activity was normal and frequent. His own tracings afford convincing proof of the error of his views. To return to Case 2, we find in Fig. 6 an interesting arrhythmia. The heart was beating in the same manner as at the height of the paroxysm for series of two, three, or even twelve small beats, the groups being separated by large full radial pulse waves.



FIGS. 7 and 8.—Tracings showing a great number of interpolated normal contractions. In Fig. 7 the prolonged diastole preceding the normal contraction is well shown.

In Fig. 6 the longest series shown is one of seven beats, but in some tracings the continuous series were much longer. An analysis of the jugular pulse reveals the occasional appearance of a wave *a* caused by an auricular systole, and followed by *c*, the sign of a systole of the ventricle. We see also that when this occurs, the preceding diastolic period is distinctly longer than when the ventricular rhythm is predominant.

For example, at 4 in Fig. 6 the diastole is much longer than at 1, 2, or 3. This is also well seen in Fig. 7. This longer diastole terminated by an auricular systole adequately explains the occasional full large radial pulse waves. For under such conditions the ventricle would have more completely recovered its contractility, and being preceded by an auricular systole would be more efficiently filled.

The important point to note in these tracings is this prolongation of the diastole in relation to the normal beats, which only occur after such prolonged diastoles. It signifies that temporarily the auriculo-ventricular bundle had ceased to serve up its usual periodic stimulus; the auricle therefore, freed from the domination of this abnormal stimulus, is enabled to contract in response to its own normal stimulus, and to initiate a systole of the ventricle in the natural manner.

This tracing proves that the auricle has not been paralysed, and supports the view that it has actually been contracting at the same moment as the ventricle, because the auricular systoles when they appear always do so after a delay greater in duration than the length of the cardiac cycles found during the paroxysm.

If the auricle did not contract simultaneously with the ventricle, and so use up its stimulus matter, there is no valid reason why the wave *a* should not crop up in the tracing at points varying considerably in distance from the last cardiac contraction in a group of the ventricular type; but we note that following on the last systole of one of these groups, a diastolic pause is always present of sufficiently long duration to allow the stimulus matter to accumulate at the normal site (the opening of the large veins into the auricle), in answer to which stimulus a systole of the auricle begins and is followed in due time by that of the ventricle. These points are well shown in Figs. 6, 7, 8.

The auricle therefore, in the absence of the abnormal stimulus which during the paroxysm has been causing it to contract and dominating the rhythm, is able to respond to its own stimulus, and, until the recurrence of this abnormal stimulus from the auriculo-venticular bundle, to dominate the rhythm.

In Fig. 7 we observe that there are a greater number of normal beats, and in Fig. 8 they are still more numerous. The prolonged diastole preceding the normal beat is very well shown at 3 in Figs. 7 and 8.

Fig. 9 was taken after the attack was over, and in it we see that the auricle is continuously dominating the rhythm. Thus every ventricular systole is preceded by a systole of the auricle.

When we examine the records of Case 1, we find again the ventricular type of the venous pulse during the paroxysms (see Fig. 10), but between the paroxysms the venous pulse is of the normal auricular type.

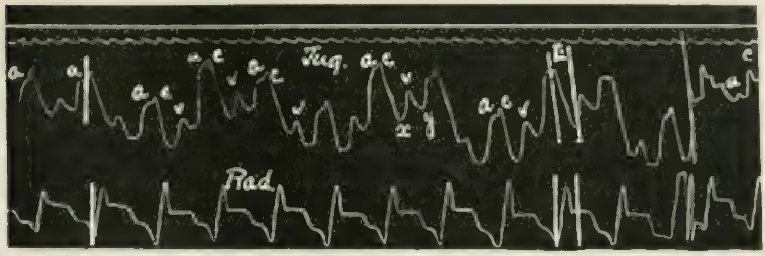


Fig. 9.—Tracing from the same patient taken on 15th March, after the paroxysm. It shows the normal rhythm.

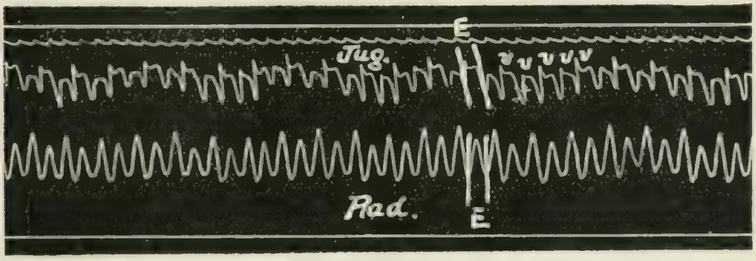


Fig. 10.—Tracing from Case 1 during a paroxysm. The frequency is over 200 per minute. The jugular pulse is "ventricular" in type (see Fig. 4, I.). There is only one wave *v*. The radial pulse is markedly alternating. Alternation is also discernible in the jugular pulse. In this tracing the period E included between the two parallel lines indicates the whole cardiac cycle of systole and diastole, not the sphygmic period only.

In this patient we had a most beautiful example of an alternating pulse (Figs. 10, 11, 12). A large beat is followed by a small

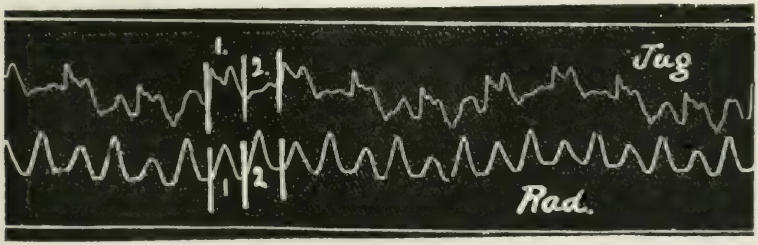


Fig. 11.—Tracing from the same patient during a paroxysm. The alternation in the jugular pulse is very marked. The large radial pulse corresponds to the small jugular and *vice versa*.

one. This alternating action of the heart became at times so marked, that only one-half of the contractions of the heart were able to produce a perceptible radial pulse. A superficial examination of the tracing (Fig. 11) might give rise to the idea that the smaller rise was a dicrotic wave, and not a separate pulse beat. Simultaneous tracings taken from the radial and the apex beat, and from the radial and the conus of the right ventricle, proved that the smaller wave was in every case the consequence of a ventricular systole. The pulse is monocrotic and alternating.

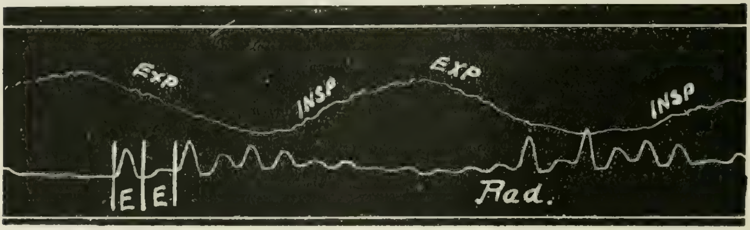


FIG. 12.—Tracing from the same patient during a paroxysm. It shows a typical condition of the pulsus paradoxus. The pulsus alternans is very obvious. The upper undulating line records the respiratory movements. In this tracing the period **E** indicates the whole cardiac cycle of systole and diastole, not the sphygmic period only.

On auscultation the following sounds were heard—a loud, short slapping sound, followed by three less distinct sounds, the third being a little more clearly defined than the second and the fourth. It was not easy to analyse these sounds with the heart beating at 200, the first impression being that there were two independent

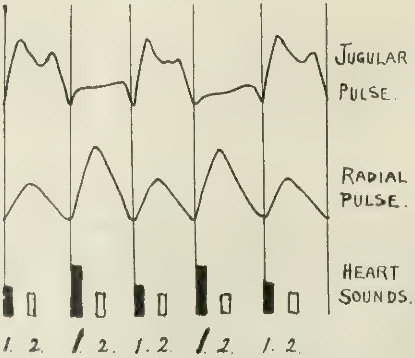


FIG. 13.—Diagram illustrating the alternation in the jugular and radial pulses, and also the character of the heart sounds in relation to this alternation. The louder sounds were only heard in relation to the larger radial pulse waves, and occurred at the commencement of ventricular systole.

series of sounds, the loud, short sound at 100 per minute, and a running accompaniment of lesser sounds. The diagram (Fig. 13) demonstrates the relation of these sounds to the alternating action of the heart. True alternating action of the heart is rarely met with, but Wenckebach and Mackenzie have published a few cases. Its presence signifies impaired power of contractility. In this case not only was there an alternating arterial pulse, but the venous pulse also alternated. I do not know of a similar condition in the literature.

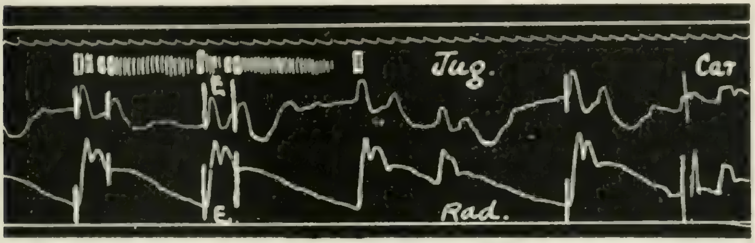


FIG. 14.—Tracing taken from Case 3. The jugular pulse is of the ventricular type (see Fig. 3). There is no indication of any contraction of the auricle preceding the period E. The heart is beating infrequently 40 to 45 beats per minute. The short upright lines indicate the murmurs and sounds heard in this case. No presystolic murmur was audible.

It is interesting to note that the larger of the radial pulsations is synchronous with the smaller of the venous pulsations, and *vice versa*. In explanation, I would suggest that when the heart contracted strongly its action was generally more normal and efficient, as shown by the larger radial pulse; the next contraction, however, was weaker, the muscle had not quite regained its normal contractility, and to add to its difficulties the blood pressure would be relatively higher in the aorta after the previous more vigorous systole. The result followed that less blood is impelled onward, and more back into the jugular and pulmonary veins.

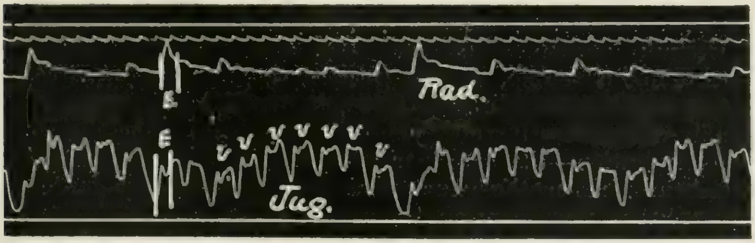


FIG. 15.—Tracings taken from the same patient during a paroxysm. The heart is beating with a frequency of 160 beats per minute. The jugular pulse is of the ventricular type (see Fig. 4, I.). Note the great diminution in the length of diastole and also the definite shortening of the period E.

Fig. 12 is a beautiful example of a paradoxical pulse as it occurred in this patient. In it the alternating quality of the heart's action is also seen.

Two tracings are reproduced representing the type of heart activity met with in Case 3. Fig. 14 was taken during a period of tranquil action of the heart, and has already been discussed. In Fig. 15 we have a record taken during one of the short paroxysms. The right ventricle is seen to be contracting with remarkable regularity, in great contrast to its action between the attacks. The left ventricle is contracting regularly as to frequency but irregularly in force, many of the pulse waves being imperceptible at the wrist. The venous pulse is ventricular in type and similar to that found in Case 2 (Fig. 10).

Treatment.—A careful consideration of this division of our subject compels the admission that paroxysms tend to occur, and when in existence to follow their course towards recovery irrespective of treatment.

In some patients the paroxysms become less in number and severity with advancing years, while in others they tend to recur more and more frequently, the tachycardia becomes persistent, the heart fails, and the patient dies. Though this pessimistic view is justifiable in a broad sense, patients can, without doubt, be benefited and in some degree relieved by treatment.

In order to prevent the recurrence of the paroxysms, everything must be done to restore the normal stability of the cardiac mechanism: for this purpose general tonic treatment is valuable, the life should be free from physical or mental stress, and moderate exercise should be regularly taken. Breathing exercises are strongly recommended by Gibson. Any possible source of reflex irritation, such as intestinal, uterine, or kidney abnormality, must be looked for and remedied, and the digestion should be carefully supervised. Tea, coffee, tobacco, and alcohol must be vetoed. During the attack it is best to keep the patient on a light diet and at absolute rest in bed.

The bromides are useful in nervous and irritable patients. Knowing the tendency to spontaneous cure, it is difficult to put a correct valuation on the results of any special line of treatment.

Certain mechanical methods appear to have cut short an attack; for example, if the patient squeezes his arms and elbows tightly into the sides of his chest, and at the same time forcibly compresses his abdomen—his breath being held after a deep inspiration—the attack may be terminated. Rosenfeld (12) states that this method succeeded in four cases. It failed in Case 1. Again, pressure on the vagi is easily tried, and may be beneficial; this also failed in Case 1.

I have seen better results from deep respiratory efforts; on two occasions the attack ceased, once almost instantaneously. At other times this method failed. One can understand how deep respirations will increase the action of the respiratory pump, and so temporarily relieve the right heart. It should always be tried.

Among drugs digitalis is the most frequently used, given by mouth or hypodermically. Herringham suggests that it should be administered in large doses. It is common experience, nevertheless, that attacks often persist in the face of such treatment, even with heroic doses of digitalis. It is probable, however, that although it may not cut short the paroxysm, its exhibition is beneficial. In this connection Mackenzie (^{13}) has demonstrated that digitalis has a specific action on the auriculo-ventricular bundle: he has shown that where there is existing slight depression of conductivity, the exhibition of digitalis increases this depression, and may even cause temporary heart block. This suggests the possibility that digitalis may, under certain conditions, influence the function of stimulus production possessed by the bundle.

Portal congestion and venous stasis when present should be relieved by calomel and salines. Ice to the præcordium, mustard poultices or morphia should be used if the pain and præcordial distress are great.

In treating a patient, the height of the blood pressure must always be taken into account, and in these cases it is most important to estimate the pressure instrumentally, because, as a rule, the arteries are contracted down on their diminished contents and give erroneous impressions to the fingers.

There is no doubt that during the attacks the venous pressure rises, and that the systolic and mean arterial pressures tend to approach each other.

In Case 1, Sir James Barr has recorded a high arterial pressure in some of the earlier attacks. Latterly, however, the blood pressure tended to be lower, and at times even below normal. If the blood pressure is raised, the hippurates, benzoates, and nitrites will be of value. When contractility is impaired, as shown by the alternating pulse and the engorgement of the viscera, calcium chloride may be given with advantage, as it has been shown to have a special influence on this function.

At the best, we cannot but realise that the treatment is largely empirical. One fact is suggestive, namely, that in those instances in which the paroxysm has been cut short, the cause has been of such a nature as to alter the intracardial pressure—to remove strain or indirectly to affect the heart, as by pressing on the vagus. The heart has then suddenly recovered itself, stimuli have ceased to be served up from the auriculo-ventricular bundle, and the auricle has again dominated the rhythm.

In the meantime our endeavour must be to find a drug, or combination of drugs, which possess the specific power of depressing the function of stimulus production inherent in those mysterious fibres joining the auricles to the ventricles.

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NOTES ON TROPICAL DISEASES.

By Major D. G. Marshall, I.M.S., *Lecturer on Tropical Diseases in the School of Medicine of the Royal Colleges, Edinburgh.*

Blackwater fever.—Medical men practising in Africa frequently ask where they can obtain a good treatise on this disease, giving not only theories but the clinical experiences of those who have had opportunities of studying and treating large numbers of cases.

Such a work has just been published.[1] The author, who has spent many years in Central Africa, and has had very extensive experience of the disease, carefully considers the different theories, and then advances his own opinions, supported by the detailed history of numerous cases. The various theories are summarised under four headings, the disease being considered as—(1) A form of malaria: (2) an idiosyncrasy provoked by a diathesis; (3) the result of toxic medication; (4) a distinct disease due to a specific element. After quoting the experiences of Karamitzas, Antoniadis, and Tsakyroglou in Europe to show that the disease frequently occurs in people who have never suffered from malaria, the author quotes a series of cases to support his view, *e.g.*, that the disease is *not* a form of malaria, and that quinine, methylene-blue, and other drugs only act as occasional factors in determining the onset of the symptoms, in the same manner as chill or excessive fatigue; the conclusion finally reached being that "*blackwater fever is due to a toxin probably elaborated by a special micro-organism.*" Breaudat and Yersin have described such an organism, but their results have not been confirmed. There is a valuable chapter on treatment which opens with a few simple directions for the guidance of travellers and others in cases where medical aid is not available.

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[1] "La fièvre bilieuse hémoglobinurique dans le bassin du Congo," Dr. Louis Védy, Paris, A. Maloine.

Regarding the much vexed question "to give or not to give quinine," the following rules are laid down:—

1. If, twenty-four hours after the onset, malarial parasites are present in the blood, give a small dose (12 grs.) of quinine.
2. Never give quinine if malarial parasites are not found in the blood.
3. If in doubt (if an examination of the blood is not practicable), do not give quinine.

The routine treatment recommended is directed to the elimination of the supposed toxin, and consists of free purgation followed by frequent enemata, and in serious cases saline infusion; with diluents (warm water, weak tea) freely by the mouth. Symptoms are treated as they arise, tendency to heart failure by caffeine and champagne, vomiting, after the first day, by morphia and counter-irritation; the use of antipyretics and digitalis is contra-indicated, while a case in which death rapidly followed the administration of a small dose is quoted to show the danger of using pilocarpine in this disease.

From a letter recently received, it appears that British practitioners in Africa have been following the same line of treatment with satisfactory results.

Should a man who has suffered from the disease continue to serve in Africa? is a question which would be generally answered in the negative, but Dr. Védy considers there is little risk provided there is no persistent affection of the liver or kidneys: in fact, he holds that after three or four attacks the patient becomes immune.

Ankylostomiasis.—Attention has before been directed in these notes (October 1905) to the possibility of Scottish miners becoming infected with this disease, and the matter is brought nearer home by the fact that there are at present under treatment in the Royal Infirmary two cases in miners returned from abroad.

Many of the coalpits in Scotland present all the requisite conditions (great depth, excessive heat and moisture) for the spread of the disease should it be introduced, and as much sickness, trouble, and expense may be avoided by immediate recognition of early cases, it is absolutely essential that medical officers connected with the mining industry should, for purposes of diagnosis, avail themselves of every opportunity of seeing cases under treatment in order that they may become acquainted not only with the symptoms of the disease, but also with the microscopic appearances found in the blood and stools.

Plague.—Two reports have recently been published which throw much light on the etiology of this disease.[1]

Practically the same conclusion is reached in each report, namely, that the rat flea, *Pulex cheopis* (Rothschild), which is common in India and Australia and occasionally found in European seaports, is the means of carrying infection, and the very exhaustive experiments conducted by the Indian Commission would appear to prove that it is the only channel of infection.

It is noteworthy that while the plague bacillus was very seldom found in the stomach of the human flea, it was found in 30 per cent. of the rat fleas.

While in New South Wales such extensive experimental work was not practicable, the fact that the patients were white men living under fairly good social conditions rendered the following up of the cases less difficult, and hence the etiology could be carefully studied. The chief medical officer has been able to make the following definite statements:—

1. Plague owes nothing of its epidemic forms to communication with the sick.
2. Plague in rats is a necessary factor in epidemic plague.
3. A living intermediary is necessary to communicate the infection from rat to man.
4. That intermediary must be the flea.

These reports bring the etiology of plague closely in line with that of yellow fever, and give grounds for hoping that the measures of precaution which have been so successfully adopted in the latter disease may be found equally efficacious in combating plague.

Sleeping sickness.—The search for a cure for this disease is being actively prosecuted by numerous workers both in this country and on the Continent. Though the success claimed to have been achieved in Belgium, which has formed the subject of sensational paragraphs in the lay press, has not yet been corroborated, there is ground for hoping that the remedy will eventually be found in some preparation of arsenic.

It is satisfactory to learn that in the case of a European at present under such treatment in this country there has been a very distinct improvement. The trypanosomes have disappeared from the peripheral circulation, and remained absent for a considerable time, and, what is even more satisfactory, experimental inoculation with blood of the patient into various animals has been attended, so far, with negative results.

It is, however, well known that trypanosomes are often absent from the blood for months and suddenly reappear. A definite conclusion cannot therefore be reached, and will wisely be withheld, until the patient has been under treatment for a protracted period.

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[1] "Preliminary Report of the Indian Commission," *Journ. Hyg.*, Cambridge, 1906, September; "Report of the Board of Health on Plague in New South Wales during 1905," Sydney, 1906, July.

To those particularly interested in the subject the records of recent experimental work by Mesnil and Nicolle[1] and by Thomas[2] may be recommended.

The trypanosomes of tsetse flies.—In the "Sixth Report of the Sleeping Sickness Commission," Gray and Tulloch described the multiplication of the *T. Gambiense* in the alimentary canal of the *Glossina palpalis.* Shortly after the issue of this report Koch published two articles in which he described a similar process in other species of *Glossina*, and it was somewhat hastily assumed that Bruce's original idea—that the tsetse acted simply as a carrier—was incorrect.

Novy[3] and Minchin[4] have separately been making further investigations, by which it is shown that Bruce's opinion was after all the correct one.

Novy, working with slides sent to him by Gray, and reasoning from the analogous growth of herpetomona and crithidia in the mosquito, is of opinion that "wholly erroneous conclusions have been drawn from the seen facts, and that the trypanosomes met with in the tsetse are cultural forms of harmless non-pathogenic flagellates." He describes and figures four types with male and female forms, and suggests the name *T. Grayi* for the type which occurred in greatest numbers.

Minchin's work, in which he was assisted by Gray and the late Lieut. Tulloch, yields much the same results, but he goes a step further, and bestows names (*T. Grayi* and *T. Tullochii*) on two types.

While such painstaking work is worthy of all admiration, the authors themselves would probably admit that, as they have been working with somewhat scanty material, their present opinions can by no means be regarded as final.

"*Tropical*" *blood parasites in British birds.*—Recently was published a short article[5] by Symmers, describing the appearances of a filaria he had found in the blood of a bird in Ireland; the discovery was commented upon in another journal as though it was unique, but Coles, in a letter,[6] points out that such an occurrence is by no means uncommon.

Members of the recent post-graduate course in Edinburgh were afforded an opportunity of seeing filaria in the blood of thrushes obtained both in the south of England (Coles) and in the vicinity of Edinburgh.

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[1] *Ann. de l'Inst. Pasteur*, Paris, 1906, July.

[2] "Report on Trypanosomes, Trypanosomiasis, and Sleeping Sickness, Liverpool School of Tropical Medicine, Memoir xvi."

[3] *Journ. Infect. Dis.*, Chicago, 1906, May 18.

[4] *Proc. Roy. Soc. London*, 1906, October, B. 527.

[5] *Brit. Med. Journ.*, London, 1906, October 20.

[6] *Ibid.*, 1906, November 3.

In this connection it is interesting to note that in the Second Report of the Wellcome Research Laboratories, Khartoum, just to hand (a most valuable record of careful scientific work), Neave gives a coloured drawing (Plate xxi.) of an "object" which he found occurring plentifully in the blood of a guinea-fowl. He presumes it is a parasite, but is unable to determine its nature, and states he has been informed that a similar "object" had previously been found in the blood of a corncrake in England. This refers to a corncrake which was shot for me by a keeper near Dunbar. The blood of this bird contained numerous bodies exactly resembling those figured by Neave, and during the last week exactly similar bodies have been found in the blood of a water-hen shot near North Berwick. Slides have been sent to Laveran with a view of obtaining his opinion on the nature of the bodies, and further reference will be made to the matter in these notes at an early date.

Recent work has shown that the occurrence of other parasites (trypanosomes, halteridia, pyrosoma, etc.), usually supposed to be confined to tropical regions, is not at all uncommon in the blood of animals, birds, and fishes in this country. The work is highly interesting, but whether the results will prove of any practical value, time alone will show.

"The Effects of Metazoan Parasites on their Hosts" is the title of a paper by Shipley and Fearnsides[1] in which the different means by which these effects are produced, as situation, size, migration, absorption of juices of the host, and the development of toxins, are very fully discussed, and there are very numerous references to the literature of the subject.

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[1] *Journ. Econ. Biol.*, 1906, vol. i. pt. 2.

REVIEWS OF BRITISH AND FOREIGN LITERATURE.

The Diagnosis of Nervous Diseases. By Purves Stewart, M.A., M.D., F.R.C.P., Physician to Out-Patients at the Westminster Hospital. London: Edward Arnold.

Diseases of the nervous system are among the most difficult not only to understand, but also to describe. They lack that clear definition which is common to most other conditions, and they so vary and run into each other, that in descriptions of them theoretical considerations bulk too largely, and the main points are more or less concealed, or not sufficiently evident. Evidently recognising this, Dr. Purves Stewart, in his volume, "The Diagnosis of Nervous Diseases," has approached his subject in an original and simple manner, and has produced a book on entirely new lines, one essentially for the practitioner, which will be very welcome. He has confined himself to diagnosis, and, avoiding unnecessary details and arguments, he has taken up and explained rather the various symptoms and clinical signs which may arise in association with diseases of the nervous system. In the result he has been eminently successful, and by his clearness of diction and orderly sequence of his lectures, aided to a great extent by a wealth of illustration, he has simplified for the medical man what is too often difficult to understand and not well put. The standard of excellence of all the lectures is high, and it is therefore almost unnecessary to individualise. Lecture 17, on "Postures and Gaits," Lecture 20, on "Affections of the Sympathetic," and Lecture 23, on the "Cerebro-Spinal Fluid," are particularly well done, and deserve special mention. Postures and gaits are specially difficult to describe in writing, in a clear and simple manner, so as to convey to the reader a good mental picture of what the actuality is like; but in this Dr. Purves Stewart has succeeded admirably, without being at all diffuse.

In Lecture 20 he has focussed, shortly and by particularly apt and original illustrations, the clinical results of affections of the sympathetic, which evidently, in his experience, are not of so great rarity as might be imagined. In his final lecture on the "Cerebro-Spinal Fluid" he has presented to his readers the latest information as to its relationship to the various diseases of the nervous system, and indicated what uses its systematic and thorough examination may have.

In the volume there are 192 illustrations, and Dr. Stewart has shown wisdom in such a large number. They are excellent, and almost every objective sign that may occur in nervous diseases has its corresponding illustration, and he who runs may read. Many of them are original and quite out of the beaten path, and perfectly typical of what they are meant to represent. Particularly nowadays, when so much ground has to be covered in reading to keep abreast of recent advances, the book can be heartily recommended—easy to read, carefully arranged, and without being diffuse, containing sufficient to form an excellent guide and help in the diagnosis of nervous diseases.

A Treatise on Surgery. By George Ryerson Fowler, M.D., Brooklyn, New York. 2 vols. Philadelphia and London: W. B. Saunders & Co.

A work from the pen of George Ryerson Fowler—one of the most advanced and brilliant exponents of American surgery—would have attracted attention in this country at any time, but the appearance of the treatise before us, within a few weeks of the almost tragically sudden death of its author, compels an added interest. Dr. Fowler died in the prime of life, full of vigour, and actively engaged in the pursuit of his professional work, and it may at once be said that the two handsome volumes now under review, which embody his most mature views on the surgery of his day, form a memorial worthy of him, and will long continue to reflect renown on the medical school of which he was a distinguished member.

The author's primary object was "to bring together the most recent and improved methods of surgical practice," rather than to write an exhaustive exposition of the science and art of surgery. Hence it is that the fundamental principles of surgery, which to the student are even more important than the technical details of operative manipulations, are disposed of in a comparatively small space, and often in a form which falls short of rendering them instructive to the novice. The brevity with which some of the problems of surgical pathology are treated, and the cursory manner in which many debated points are dealt with, prevent this work serving as a source of reference on these matters for the more advanced reader. The author is at his best in describing practical work, whether it is the application of laboratory methods to the clinical investigation of disease, the details of operative technique, or the manipulations involved in treating fractures, dislocations, and deformities. The short section on laboratory aids in surgical diagnosis and prognosis is an admirable summary of the more recent advances in such subjects as the examination of the blood, the chemical analysis of the urine, cryoscopy, or the examination of stomach contents. Surgical anæsthesia, also, is fully discussed, and the relative merits of ether and chloroform judicially considered. Regarding spinal anæsthesia the author says "the method should not be used as a routine procedure, and can never replace ether and chloroform," . . . and "should be reserved for those individuals in whose cases, on account of the presence of either heart disease, pulmonary disease, or renal disease, a general anæsthetic is contra-indicated." We have quoted these observations as an example of the clear and emphatic way in which the author expresses his personal opinion on matters of present-day interest that are still unsettled.

A copiously illustrated chapter is devoted to bandaging. The figures are very artistic, but, without wishing to be captious in our criticism, we may venture the remark that many of the bandaged limbs depicted are perilously near the point of gangrene.

Student and practitioner alike will find the chapters on regional surgery full of interest and instruction, and if we were to select any sections of higher merit than others, they would be those dealing with the surgery of the abdomen.

We cannot omit a reference to the excellence of the illustrations, on which Dr. Fowler evidently expended much care and thought.

Manual of Medicine. By Thomas Kirkpatrick Monro, M.A., M.D. Second Edition. London: Baillière, Tindall, & Cox.

It is a real pleasure to read, and then to review, such a thoroughly good book as this. In his preface Dr. Monro tells us that it has been revised from beginning to end, and after reading through the manual we can vouch for the care and completeness with which the revision has been carried out. We need not say more of the general arrangement of the book than that it is on the usual plan, and includes a full account of most tropical diseases, and a chapter on cutaneous affections. We may, however, cite as an excellent feature the judicious way in which footnotes have been used to introduce topics which, though interesting as matters of history, of speculation, or otherwise, are more suitable mentioned thus than in the text. These footnotes considerably enhance the value of the book. Dr. Monro has been singularly happy in preserving a balance in the amount of space devoted to subjects of varying importance, yet even his shortest notices of only a few lines never degenerate into mere definitions, but give a distinct idea of the disease and its treatment. We can only mention here a few of the points we had noted in illustration of the way in which modern researches have been utilised by the author. The use of intraspinal antiseptic injections in cerebrospinal meningitis, of Sclavo's serum in anthrax, of decompression chambers in caisson disease, Lees' plan of treating chorea with large doses of salicylates and alkalis, and Castellane's discovery of the spirochæte pallida in yaws, are all mentioned, and the sections on tropical diseases are all in accord with the latest discoveries of medicine—even the report of the Royal Society on the transmission of Malta fever by goat's milk, issued in March last, is referred to. It must not, however, be supposed that "up-to-dateness" is the sole, or even the chief, merit of the manual. It is an eminently practical, clearly written guide to medicine,—certainly one of the best of its class that we have seen. Though it is really but little open to criticism, we venture upon a few suggestions for future editions. In discussing the treatment of diabetes, the risks of a too exclusive proteid diet are not pointed out; students ought to be taught the danger of this, especially when the presence of acetone bodies in the urine points to impending acid intoxication. The description of Stokes-Adams' disease is rather brief, and there is no account of heart-block. The visceral type of arterio-sclerosis might advantageously be treated of more fully. Scurvy-rickets is a disease which, in its milder forms, is very apt to escape recognition. Now, slight hæmaturia is an extremely constant symptom, and ought to have been mentioned, because, taken along with tenderness of the limbs, etc., it often serves to clinch a doubtful diagnosis. Again, reference might have been made to Kocher's plan of healing Graves' disease with large doses of sodium phosphate. Both forms of spondylosis are classed under osteo-arthritis; probably Bechterew's type is more allied to nervous disorders.

These are small matters, however, in comparison with the great general excellence of this text-book of medicine.

Second Annual Report of the Henry Phipps Institute for the Study of the Treatment and Prevention of Tuberculosis. Philadelphia: Henry Phipps Institute.

Americans are nothing if not thorough. When Henry Phipps, in the year 1902, made his munificent bequest, and determined that it should be devoted to the advancement of our knowledge of the nature, treatment, prevention, and cure of tuberculosis, he intended that the work should be done in a thorough manner. The report of the first year's working of the Henry Phipps Institute, published in 1905, early showed that his aims were likely to be realised; and the report of the second year's work done, which has recently appeared, gives further promise that his object will be attained. An institute fully equipped, amply endowed, possessing a staff of no less than thirty-three well-qualified physicians, many of whom are specialists in that particular branch of the subject over which they preside, together with a competent staff of nurses, which has treated during two years no less than 2500 cases of tuberculosis, is one whose operations merit our most careful and respectful consideration. To obtain a proper idea of the value of this work which is being carried on in Philadelphia, one must study this report for one's self.

Not the least valuable part of the work lies in that done in the nursing department. Here probationers are taken in, and thoroughly trained on lines designed to specially fit them for educating and nursing the consumptive poor either in institutions or in their private homes. They are trained to be not simply nurses in the ordinary sense, but they are transformed into teachers and missionaries of hygiene, and as such they are doing a work of the very greatest value, and one which, so far as is known, can be efficiently done by such as they alone.

Each patient, as he or she comes under observation, becomes the object of most careful study. The facts of the case, not only clinical, but sociological, geographical, racial, etc. etc., are carefully elicited and separately tabulated. In this way generalisations of great interest and value have been acquired. For instance, it may be new to some to know that of the 2500 odd cases of tuberculosis which passed under review, over 2000 of these occurred in persons who were married. And whilst some of us were aware of the prevalence of tuberculous disease in Ireland, it is doubtful if it were quite realised that of all those races in the world which contribute its quota of victims to the disease, it is from the Irish race that tuberculosis exacts its heaviest toll. Not only is this so where the parents are both of Irish extraction, but it holds good in cases of mixed parentage. Wherever in such cases one of the parents belongs to the Irish race, the incidence of the disease amongst the offspring of such a marriage is heavier than where both parents belong to other nationalities.

By no means the least interesting facts to be found within the boards of this valuable compilation are some of those observed in the neurological and mental departments. With that scant respect for orthodoxy which characterises the people of a youthful nation, and with minds untrammelled by views which have come to be accepted by us as accurate because traditional, these investigators bring to bear upon their work an originality which is quite refreshing. The fact that the "spes phthisica" as a prevailing manifestation of the disease has stood the test of generations, does not seem to impress them. We are now informed that we have been worshipping a fetish. They tell us that "experience has prompted them to state that 'spes phthisica' is extremely rare. The impression one gains after a series of inquiries from the patients themselves as to their mental state is that the greater number are more or less depressed, though they still maintain the hope of improvement or cure." That may be so; we must look again.

The hundred odd pages devoted to a description of the work done on immunisation and inoculation treatment is brimful of interest. But in so far as the investigators have confined themselves, in their inquiry upon the therapeutic side to the employment of Maragliano's serum, there remains a great deal to be done here yet. It is important to note, moreover, that the verdict in this case is unfavourable. There is one blemish. It is with feelings of blank surprise that one closes a perusal of this section without finding any reference whatever to Wright's methods and work. In this respect their researches are being conducted on antiquated lines. But Wright has been lecturing in America recently, and no doubt steps will be taken to bring the work done in this department up to that high level attained in the various other departments of the Institute before the report of next year's work appears. As a record of honest, painstaking, and comprehensive labour, the report is a most valuable one; and to those professing to keep themselves abreast of the current literature of the day on the subject of the tuberculosis problem, it is absolutely essential.

Therapeutics: Its Principles and Practice. By HORATIO C. WOOD, M.D., LL.D., etc. Twelfth Edition. Revised by H. C. WOOD and H. C. WOOD, Jun. Philadelphia and London: J. B. Lippincott Co.

THE twelfth edition of this well-known text-book fully maintains the high standard set in previous editions. It has been thoroughly revised and adapted to meet the requirements of the last (1905) issue of the United States Pharmacopœia. The changes in this respect are more numerous than on former occasions. Over seventy new drugs have been introduced, and there are a number of important alterations in classification and description. The chapters on expectorants and disinfectants have been rewritten, and a new classification adopted. It is to be noted that under expectorants no mention is made of ammonium carbonate, though the chloride of ammonium is fully discussed. We failed to find any mention of the use of calcium salts in cases where the coagulability of the blood is deficient. In the chapter on disinfectants a mass of interesting information has been collected, and tables have been prepared showing the relative efficacy of some widely advertised proprietary preparations. It is seen that none of these preparations can compete either in efficiency or price with perchloride of mercury or chloride of lime. Among the new drugs which are discussed are gelatin, urotropin, veronal, lysol, helmitol, and other compounds, which have justified their introduction into medical practice, and may be considered to have established themselves as useful remedies. In regard to gelatin, the authors state that the best method for using it to check hæmorrhage is administration by the mouth, in the form of a 10 per cent. jelly. It is interesting to note that, though this edition is brought into line with the new issue of the United States Pharmacopœia, the authors do not follow the official plan of mentioning one average dose, but still give the old double dosage. On the whole, we can recommend the book as one of the best works on the subject in the English language. It is written by one who has had a very large clinical experience, and is more adapted to the use of the general practitioner than many other works on pharmacology. Most modern text-books are written by pharmacologists who have not the necessary clinical experience to deal with therapeutics in a satisfactory manner. As a clinician of large experience, Wood is able to bring his own observations into judgment on many disputed points, and, from the point of view of the medical man, this adds very largely to the value of the book.

Trial of Eugène Marie Chantrelle. By A. Duncan Smith, Advocate. Glasgow: William Hodge & Company.

There are few more sordid stories of domestic unhappiness than that unfolded in the latest volume of the series of Notable Scottish Trials.

Many can remember the good-looking Frenchman, who was a well-known figure in Edinburgh, but few who saw him gay and *débonnair* imagined that behind it all there lay thinly veiled the heartless cruelty of a man who had seduced his wife while still a schoolgirl, and afterwards treated her with relentless neglect and unkindness. Chantrelle was an exceedingly clever and versatile man, and there can be no question that, but for one or two comparatively slight and seemingly unimportant miscalculations in the perpetration of the crime of which he was convicted, the trial, the story of which is so well told by Mr. Duncan Smith, advocate, would not have taken place.

If only the escape of gas had not been so crudely produced, and had been allowed to take place for a longer period before discovery, the death would almost certainly have been ascribed to accidental causes, and the suspicion of narcotic poison would never have arisen.

Fortunately for society, the deepest and most calculating criminals generally overlook some point in their schemes, however well laid, which eventually gives a clue and brings them to justice.

No one who reads this highly interesting volume can have a doubt, notwithstanding some discrepancies in the scientific evidence, that rarely has the last penalty of the law been more richly deserved than in this case.

NOTES ON BOOKS.

With the commencement of another year the question of diaries becomes one of importance to every medical man. We have received from John Walker & Co. Ltd., Farringdon House, Warwick Lane, London, several extremely neat and well-got-up diaries, of which their

No. 17 and No. 24 appeal to us as being specially fitted for the busy man's pocket. Their diaries are produced, however, in such variety of size and binding, that there can be little difficulty in suiting everybody's taste and requirements.

Food and Digestion in Health and Disease, by M. A. Dutch, M.D. (Henry Kimpton, London). The aim of the author has been to furnish for the lay reader "as unbiassed an account and as accurate and widespread a survey as space would allow of the principles which govern Food and Digestion in Health and Disease." The recommendations made are based on the teaching of standard works on diet as to daily food requirements. As recent advances in our knowledge of this subject have proved the inaccuracy of the traditional teaching, it would be well if, in a future edition, the views expressed as to food requirements were more in accord with the teaching of well-established facts. The appendix on invalid diet formulæ contains many useful receipts.

Clinical Lectures on Neurasthenia, by T. D. Savill, M.D. Third Edition (Henry J. Glaisher, London). Dr. Savill holds that in all cases of neurasthenia there exists some degree of weakness of the nervous system, inherited or acquired, which renders the nervous system vulnerable; secondly, that this may be developed into neurasthenia by a great variety of determining causes; and thirdly—and this is a view not generally held by neurologists—that in the majority of cases the determining cause is an auto-intoxication which is usually of gastro-intestinal origin. His book is essentially a record of carefully observed cases, and in accordance with his main thesis very special attention is throughout directed to the general medical as opposed to the strictly neurological aspects of the cases described. The author is to be congratulated on the appearance of a third edition of a work which is a decidedly valuable contribution to the literature of the subject.

This handbook of gynaecology—*Diseases of Women*, by J. Bland Sutton, F.R.C.S., and Arthur E. Giles, M.D. (Rebman, London)—which has reached a fifth edition, testifies to the industry of its authors in their endeavour to keep abreast of the rapid changes which demand revisal from time to time, if the student is to be kept in touch with modern views and methods. For not only have many of the parts been carefully revised, but in addition exceedingly interesting and instructive chapters, dealing specially with chorion-epithelioma, extra-uterine gestation, and tumours of the ovary, have been introduced, which greatly add to the scientific as well as practical value of the volume. The part of the volume devoted to gynæcological operations is capable, however, of further proportional expansion. On p. 245, the writers state that in recent years the mortality of vaginal hysterectomy for cancer of the cervix has reached the low point of 5 per cent., and when we come to this important major operation on p. 477, we find the method of procedure described within the brief space of little more than two pages. The book is nevertheless one which can be recommended on account of its convenient size.

RECENT ADVANCES IN MEDICAL SCIENCE.

MEDICINE.

UNDER THE CHARGE OF

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Heart-Block and Stokes-Adams' Disease.

As a clinical type of the Stokes-Adams' symptom-complex, the case reported by Finny (*Dublin Journ. Med. Sc.*, 1906, May), under the title "Bradycardia with Arrhythmia," may be quoted. The patient was a woman, æt. 42. The pulse rate was 22, while the auricles contracted thrice as frequently. There was thus dissociation of the auriculo-ventricular rhythm, as was verified by an examination of the movements of the heart on the fluorescent screen. In addition to the bradycardia, the patient suffered from the seizures which characterise the disease. These seizures were preceded by a delay in the radial pulse of about ten seconds, and, while they lasted, the intervals between the beats of the pulse were five, seven, to ten seconds. The seizures varied in severity, and are described by Finny as follows:—"A 'weak turn' was ushered in and preceded by a delay in the heart's beat and radial pulse. Thus, when a pause lasted seven to ten seconds, the patient's face became pale, the eyes had a very frightened and strained look, and some little restlessness of the head and hands ensued; and it ended by a slight flushing of the cheeks, some tears in the eyes, and the patient would give a slight sigh, or a little hum or cough, and the 'weakness' would be over. The 'slight fit' came on with a soreness or sharp feeling in the stomach and left side of the thorax, which would then extend up the right side of the chest into the head and eyes. The pallor of the face would be more marked, the eyes would turn up to the right side, and the hands would fidget and the fingers catch at the sheets. The patient always came out of this fit in a more frightened and slightly dazed manner, and the eyes had a strained and somewhat blind look for some minutes. The 'severe fit' was more distinctly epileptic, with sudden onset, the patient falling back if sitting up in bed, great pallor, convulsive movements of hands and arms, and also slightly so of feet, unconsciousness for five or ten seconds, and then great flushing of the face, and the patient came out of it very confused, and was dull and nervous the whole day following." Finally, the patient died in a severe syncopal attack, with convulsions and Cheyne-

Stokes respiration. Finny noted occasionally that during the long pause of the heart—the period between the widely separated ventricular systoles—feeble, distant heart-sounds could be heard. These might have been (*a*) hemisystoles, (*b*) auricular contractions, or (*c*) feeble ventricular contractions [cf. Gibson, *infra*]. The fact that the circulatory precedes the cerebral disturbance suggests that cerebral anæmia is the proximate cause of the syncopal attacks.

Hay (*Med. Chron.*, Manchester, 1906, September) describes the paroxysms as varying from slight dizziness to severe convulsions and loss of consciousness, lasting several minutes. (1) They may supervene in an apparently normally acting heart. (2) They may occur in patients with persistent partial heart-block. (3) They may occur in patients in whom the heart-block is complete. In these three classes the paroxysms are associated with ventricular stoppage. The ventricle suddenly ceases to contract, while the auricles continue contracting, and that with increasing frequency during the progress of the fit. (4) Another class of case presents clinically all the symptoms of Stokes-Adams' disease. There is partial or complete heart-block, but, instead of the ventricular stoppage during the fits, there is a storm of feeble, ineffective, extra systoles, during the occurrences of which the blood pressure falls, and cerebral anæmia is produced, as in classes (1), (2), (3). The chief part of Hay's paper deals with the relations of vagus action in heart-block. Erlanger's work shows that stimulation of the vagus in complete block does not influence the ventricular rhythm, the auricular rate alone being slowed. Both Gaskell and Erlanger have proved that in partial block the slowing of the auricles, which is produced by vagus inhibitory action, results in the ventricles taking on their own independent rhythm, *i.e.* the transformation of partial into complete block. Gaskell has further proved that after the complete block caused by vagus inhibition has passed away, the conducting power of the auriculo-ventricular band improves to such an extent that every auricular impulse, instead of every second or third only, may be transmitted. Hay reports an analogous condition in a man who had suffered for a year from bradycardia, the result of depressed conductivity of the auriculo-ventricular fibres, the ventricles responding to only every second or third auricular systole. In its progress the case developed remarkable variations of conductivity: Thus on 7th, 8th, 9th, and 10th March there were typical Stokes-Adams' seizures; on the 9th there was complete block, which was replaced on the same evening by a 2 : 1 rhythm; from the 10th to the 17th the conductivity was normal. It then became depressed; on the 27th there was for the second time complete heart block, and on the 29th normal conductivity was re-established. The case progressed in this fashion until death, which was preceded by five weeks of complete block. On post-mortem examination the auriculo-ventricular bundle was found to be involved in a fibrous mass. In this case the phenomena observed clinically—transformation of partial into complete block, followed by a period of normal conductivity—were quite analogous to those produced experimentally by Gaskell. In such cases there must be two factors—(1) The organic lesion of the auriculo-ventricular bundle; and (2) nervous influences altering the functional capacity of the heart. Syncopal attacks are more common in partial than in complete block, and more is known as to the mechanism of stoppage in the former than in the latter class of case. Practically, any interruption or alteration of the already defective auriculo-ventricular conductivity suffices to start the ventricles (after a brief pause) on their own rhythm. No such explanation can be given for the ventricular stoppage in cases where, from complete block, the ventricles are already contracting in their own rhythm. In this case the ventricular rhythm must be disturbed by some cause operating by preventing the intraventricular exciting stimuli spreading from their point of origin to the rest of the muscle fibres [cf. Schmoll, *infra*]. In this connection Hay quotes a case of Barr's, in which there was complete heart-block, and in which ventricular cessation and syncopal attacks could be produced by making the patient take a deep breath, and hold his chest expanded. Hay suggests that this acted by producing a sudden physical stress on the ventricular wall.

Schmoll (*Deutsches Arch. f. klin. Med.*, Leipzig, 1906, Bd. lxxxvii. Hefte 5 and 6) records two cases of Stokes-Adams' disease. Both were typical examples, showing complete dissociation of the rhythm of the auricles and ventricles, bradycardia, and cessation of the pulse during the epileptiform seizures. In the one case examined post-mortem the auriculo-ventricular bundle was invaded by scar tissue. In the patient on whom the following observations were made, the intervals between the auricular contractions lasted 1·0 second; between the ventricular contractions, 2·3 seconds. Muscular effort increased the frequency of the former, but not of the latter. The injection of 1 mgrm. of atropine had the same effect, the duration of the auriculo-systolic interval being reduced to 0·75 second, while the ventricular rhythm was undisturbed. Schmoll points out that while all recent work proves that Stokes-Adams' disease only occurs in the condition of heart-block, we may have heart-block without the temporary abrogation of the pulse and epileptic attacks which constitute the Stokes-Adams' syndrome. In addition to the heart-block, there must, therefore, be a second causal factor. What this is in partial heart-block Erlanger and Gaskell's work gives a clue to, but the explanation of the production of the ventricular cessation in complete heart-block is less obvious. Presumably, the stimulus which arises in the ventricle and causes it to beat independently is blocked for the time being. If this be so, we must suppose that the period during which the heart stops beating will be a simple multiple of the duration of the individual systolic intervals. This seems to have been the case in His's patient, in whom the pulse before the attacks was 36, falling to 18, then rising to 36, then falling to 12, and finally rising to 24. Such an observation as this suggests that the stimuli to ventricular contraction went on rhythmically, but that some were blocked, and therefore ineffective. Schmoll made some observations bearing on this point. Under the influence of great muscular effort the pulse of one of his patients could be reduced in frequency from 26·1 to 17·1 per minute, *i.e.* a ratio of 3:2, or, in other words, two systoles of the slower rhythm were equivalent to three systoles of the more rapid. From this it is inferred that each contraction of the ventricles does not correspond to a single stimulus, but that the stimuli are more numerous than the contractions they evoke. In the case in point it is supposed that stimuli occurred at intervals of 1·15 second, every second one producing a contraction, giving a rate of 26·1 per minute; after exertion, only every third stimulus was followed by a contraction, giving a rate of 17·1 per minute. Support is lent to such an hypothesis by the fact that in paroxysmal tachycardia the pulse rate is suddenly doubled or quadrupled. It thus seems as though, in total heart-block, the cessation of the pulse which constitutes one of the symptoms of Stokes-Adams' disease is due, not to a lapse of the stimuli, but to a block between the intraventricular centre and the muscle fibres, comparable to the block which occurs in the auriculo-ventricular system. Schmoll's conclusions are—(1) Heart-block is a constant feature in the Stokes-Adams' syndrome; (2) it is due to lesion of the auriculo-ventricular bundle; (3) the stoppage of the pulse in the syncopal attacks arises from (*a*) the transformation of partial into complete block, or (*b*), when there is already complete block, a hindrance to the passage of impulses from the intraventricular centre to the muscle fibres—intraventricular block.

Gibson (*Brit. Med. Journ.*, London, 1906, October 27) draws attention to the fact that in heart-block the paralysing effect of atropine on the inhibitory fibres affects the auricular rhythm only, and quotes an observation of this kind made by Ritchie, in which the auricular rate was 275, that of the ventricles remaining at 36. In heart-block it is often possible to hear the faint sounds produced by the contracting auricles during the intervals between the ventricular pulsations. The independent rhythm of the two sets of chambers can also be observed on the fluorescent screen. Even when the heart is acting very slowly, the blood pressure is well maintained. In a case with a rate of 25 the maximum systolic pressure reached 270, while in another the systolic pressure was 230, and the diastolic 75. There is thus a remarkably wide divergence between the maximum and the minimum pressures. Post-mortem examination of a case of heart-block showed that the vagus and heart muscle were absolutely healthy, while there was cellular infiltration, increase of fibrous tissue, and loss of striation in the auriculo-ventricular bundle.

Mackenzie (*ibid.*) deals chiefly with the methods of recognising heart-block by taking tracings. For details, the original must be referred to. It is sufficient here to say that, by comparing and timing simultaneous tracings from the vessels of the neck and radial pulse, the relation of the auricular contraction to those of the ventricle are determined. Normally, the time which elapses between the auricular contraction and the carotid pulse (a–c interval) is ⅕ second, and lengthening of this implies diminished conductivity. Sometimes auricular systoles can be recognised in the downward limb of the radial pulse tracing of bradycardia. Digitalis may lessen the conductivity of the auriculo-ventricular fibres when it is already depressed. In illustration of this, a case is recorded in which the a–c interval was lengthened, and after a course of digitalis the pulse became irregular from the occasional omission of ventricular systoles. Tracings showed that before each falling out of a ventricular systole the a–c intervals gradually became longer and longer; after it they were shorter on account of the improved conductivity produced by the momentary rest. In the same patient, when the heart was perfectly regular, irregularity could be produced at will by the act of swallowing. After each act there were three regular beats, followed by three infrequent ones. Here, again, the infrequency was due to block, since the auricular systoles continued undisturbed. Thus vagus action and the administration of digitalis may still further lower the conductivity of the auriculo-ventricular fibres when their function is already depressed.

The *cause of the dilatation of the heart during diastole* is discussed at length by G. van Eyssetsteijn (*Nederl. Tijdschr. v. Geneesk.*, Amsterdam, 1906, tweide helf, No. 4). He concludes that it is due to seven factors. (1) The aspiratory action of the thorax, especially during inspiration. This is not, however, of great importance, as the volume of the heart as a whole is incapable of much variation, the auricles being dilated during contraction of the ventricles, and *vice versâ*, while in complete relaxation of the heart the ventricles become larger and the auricles smaller. (2) The elasticity of the heart muscle, which retracts after each systole. (3) The gravitation and kinetic force of the inflowing blood, particularly when it is driven through the auriculo-ventricular orifice and completes ventricular dilatation. (4) The recoil of the blood driven out of the arteries, which enables the ventricles as they contract to pull on the auricles in a downward direction. (5) Muscular action (*a*) of the auricles which, as they contract, pull the base of the ventricles upward, and obstruct the outflow through the coronary veins; (*b*) of the ventricles, which, as they contract and are pushed down by the recoil of the expelled blood, pull on the floor of the auricles. The enormous dilatation of which the latter are capable permits the apex to retain a fixed position. (6) The elastic tension of the great vessels which assists in restoring the base of the ventricles to its former position. (7) The constant presence of blood under pressure in the superficial branches of the coronary vessels. During auricular systole the coronary pressure in the ventricular wall rises, and during ventricular systole that in the auricular wall. This factor is more important in the case of the thin-walled auricle than the thick-walled ventricle.

SURGERY.

UNDER THE CHARGE OF

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On Hæmorrhage from the Kidney.

Casper (*Berl. klin. Wchnschr.*, 1906, No. 39) relates four cases in which nephrectomy was done for severe unilateral renal hæmorrhage, and in which none of the usual causes of bleeding, such as stone, tuberculosis, tumour, etc., could be found at or after the operation. The first case was that of a lady, æt. 56, who had suffered for two years from periodical attacks of slight hæmaturia, every three months. An exceptionally severe attack lasting four weeks, which left the patient very anæmic, finally determined surgical intervention. The urine contained blood with albumin in proportion; no pus, no tube casts. The cystoscope showed blood coming from the right ureter into a healthy bladder. The right kidney was palpable, smooth, and not tender, and was functionally less active than the left. On exposing and splitting the kidney, Casper found it apparently perfectly healthy. A small piece was excised for microscopic examination, and showed a chronic diffuse parenchymatous nephritis. The patient recovered well, put on weight, and had had no return of bleeding eighteen months after the operation. The second case presented similar features, but very severe bleeding set in three hours after the kidney was exposed, and the organ was therefore removed. The patient recovered. The kidney showed diffuse nephritis, as in the first case. From these two cases Casper concludes that severe unilateral renal hæmorrhage may arise in cases of chronic bilateral diffuse nephritis, which have otherwise given rise to no symptoms.

The remaining two cases were more difficult to explain. In each, the bleeding kidney was excised and most carefully and thoroughly examined by a competent pathologist, and in neither could any plausible cause for the bleeding be found. Both patients recovered completely. In discussing these cases, Casper maintains that there really is such a thing as "essential hæmaturia," that is hæmorrhage for which no organic source can be found in the bleeding kidney. In this he differs from Israel, Rovsing, Zuckerkandl, and other surgeons, who maintain that in such cases a nephritis is always present; while he agrees with Senator and other physicians, who believe in essential hæmaturia not dependent on organic changes in the kidney. He disagrees, however, with the physicians as regards treatment, for they advise that no surgical treatment should be carried out in cases of such bleeding, while Casper maintains strongly that exploratory operation should be done, for, he points out, malignant renal tumours may give rise to similar attacks of hæmaturia, with intervals of one or even two years between the attacks, and delay in operating in such cases may mean the loss of an opportunity to save a patient's life.

Congenital Displacement of the Kidney.

Sträter (*Centralbl. f. Chir.*, Leipzig, 1906, October 20) has collected fifty-eight cases of congenital displacement of the kidney, and adds a case of his own, that of a woman, æt. 34, who had suffered from dysmenorrhœa, with pains in the right side of the abdomen. To the right of the uterus was felt a sensitive tumour the size of a hen's egg, which was taken to be a tumour of the ovary. At the operation, this tumour was found to be a kidney lying outside the peritoneum of the broad ligament. It was pushed upwards into the iliac fossa and stitched to the peritoneum, with complete relief of the symptoms. The left kidney was in its normal position.

The condition is usually unilateral, and often on the left side; is equally common in both sexes, but is more often discovered in women. Malformation of the genitals is a common accompaniment.

There is an abdominal and a pelvic form of the condition, the pelvic being the more frequent. The kidney always lies behind the peritoneum, and is more or less fixed; it is usually small, is devoid of a fatty capsule, and its vessels are arranged more like those of the embryo, with a number of vessels instead of one. The organ is often lobulated, the hylus is directed forwards.

Pressure of the displaced kidney may disturb the functions of the pelvic organs, and may interfere seriously with pregnancy and parturition. In diagnosis, shortness of the ureter might be made use of by passing a sound and taking X-ray photographs.

The author condemns the reckless removal of such displaced kidneys when healthy, and recommends that they should be stitched in a better place.

RECURRENCE OF HYDATID CYSTS AFTER OPERATION.

THE explanation of recurrence of hydatids after operation is a much disputed question. Previous observers have ascribed it to portions of the cyst wall, or daughter cysts, having been left behind. Devé (*Centralbl. f. Chir.*, Leipzig, 1906, September 22) holds that it is due to the microscopical contents of the cyst—the hydatid sand which contains scolices. Recurrence generally takes the form of multiple cysts, and is due to the dispersion of this hydatid sand in the wound and its surroundings. Ordinary antiseptics have no influence in destroying the capacity for multiplication of these elements. At the primary operation, to prevent this recurrence, before it is opened the cyst should be injected with 1 per cent. solution of formalin, and this should be allowed to remain in the cyst for five minutes. This kills all the scolices with the greatest certainty. The only exception to this is the case of cysts in the brain and the lung, which, after being opened, should be swabbed out with gauze soaked in the formalin solution. In the multiple cysts which occur in bones and muscles, after carefully removing all the visible cysts, the cavities should be irrigated with ½ per cent. formalin.

ON THE CAUSATION OF CONGENITAL CLUB-FOOT.

DE VLACCOS of Athens (*Rev. de chir.*, Paris, 1906, November 10) believes that congenital talipes equino-varus is the result of an arrest of development of the foot and ankle, due to persistence of the fœtal position for a long time after birth. He points ont that in the newly born infant the outer border of the foot is at a lower level than the inner, and that the sole therefore looks inwards, and the foot is in the position of pronation. This position of *physiological varus* is maintained for some time after birth, and gradually gives place to the normal position in which the sole can be brought into contact with the ground. If, from deficiency of the liquor amnii or from other causes, there has been excessive pressure on the lower limbs during intra-uterine life, and the movements of the fœtus have thus been restricted, the physiological varus position is maintained, and the characteristic deformity is developed. The author further points out that the knee and hip joints exhibit corresponding deviations from the normal, and he emphasises the importance of attending to these abnormalities in the treatment of congenital club-foot. He discredits the view that these deformities are due to lesions of the central nervous system, pointing out that the muscles are normal in structure, and do not exhibit any abnormal electrical reactions.

MATAS' OPERATION FOR ANEURYSM.

IN a further communication on his operation for the radical cure of aneurysm, Matas (*Journ. Am. Med. Ass.*, Chicago, 1906, September 29) points out that a great deal of misconception has arisen with regard to this procedure, many having thought that the main object in performing the operation is to reconstruct the artery out of the sac walls. This is not so; indeed, it can only be done in a limited number of cases, particularly in fusiform aneurysms. The Matas operation consists of two fundamental proceedings—(1) The obliteration by suture of the vascular orifices opening into the aneurysmal sac; and (2) the obliteration of the sac by suture, which brings its inner surfaces into opposition, or by methods of obliteration which leave the sac undisturbed, and tend to secure healing by plastic union.

The author describes three varieties of the operation—(1) *Obliterative endo-aneurysmorraphy*, which consists in opening the sac freely, without disturbing its surroundings, and closing all visible arterial orifices within the sac by suture. The sac is obliterated by approximating its walls with buried sutures. No attempt is made to restore the continuity of the artery. (2) *Restorative endo-aneurysmorraphy*, which is only applicable to saccular aneurysms in which the parent trunk retains its continuity and normal outline, and the aneurysm is simply a sac grafted on the vessel. The sac is opened freely, the clots removed, and the opening to the artery exposed inside the sac. This is then closed by a continuous suture, which penetrates all the coats at the margin of the orifice of communication. The sac is then obliterated by bringing its endothelial surfaces together with buried sutures. By this means the inflow of blood to the sac is arrested, and the lumen of the artery remains patulous, so that the blood supply to the limb beyond is not cut off. (3) *Reconstructive endo-aneurysmorraphy* (*arterioplasty*), which is only applicable to a fusiform aneurysm in which the coats of the sac are firm, elastic, and resistant, and the two openings leading to the main artery lie on the same level. In aneurysms of this kind, especially traumatic, the continuity of the parent artery may be restored by making a new channel out of the sac walls, which can be brought together over a guide, *e.g.* a drainage tube inserted into the proximal and distal openings of the artery. Before tying the last sutures the guide is removed, and a channel is left corresponding to the original artery. The sac is then obliterated by approximating its surfaces with buried sutures of catgut, as in the previous operations.

OBSTETRICS AND GYNÆCOLOGY.

UNDER THE CHARGE OF
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Discussion on Management of Contracted Pelvis.

At the Stuttgart Medical Congress (Gynæcological Department) (*Centralbl. f. Gynäk.* Leipzig, 1906, November 3) the following subjects were discussed.

Fehling (Strassburg) dealt with the subject of pubiotomy and induced premature labour. He criticised the opinions of Zweifel and Krönig (both adverse to the latter operation), and referred to the published cases of Hardlen showing the advantages of it. Photographs were exhibited of four children of one family, who owed their lives to induced labour, the mother's first child having been perforated. From the material of the Basle Klinik, Hunzicker showed that 20 per cent. more children survived than where labour was allowed to terminate spontaneously in the same women. Even more interesting was the information that cases delivered by Cæsarean section show a higher percentage of living children at the time of birth and on leaving hospital, but at the end of the first year there were only 63·6 living children, as contrasted with 82 per cent. of children prematurely delivered. Regarding pubiotomy, Fehling prefers it to symphysiotomy, as being less dangerous for the mother and safer for the life of the child. The indicationsf or the operation he gave as primiparæ with contracted pelvis; multiparæ who decline Cæsarean section, or where in the course of delivery other risks are likely to supervene. For premature labour he gave the indications to include cases of married women who have already had one or more still-born children, and where the degree of pelvic contraction is not too great.

Pfannenstiel (Giessen) discussed the subject of indications for treatment in contracted pelvis. He emphasised the necessity of ascertaining the type of contraction (flat, generally contracted, and combined). Marked cases of contracted pelvis should always be treated in hospital, where Cæsarean section, or pubiotomy with, if necessary, induced labour, may be undertaken. In flat pelvis, Pfannenstiel does not favour forceps extraction, which he limits to cases of the generally contracted type. For inducing labour he prefers the bougie method, and recommends this line of treatment when the conjugate measures 7 to 8½ cms., especially if the transverse diameter is also narrowed. Less suitable are cases of higher degree of pelvic contraction, where pubiotomy, or, if the soft parts are rigid, Cæsarean section, is indicated. Turning and extraction by the feet give the worst results in generally contracted pelvis, and relatively the best results in ordinary flat pelvis. He emphasised very strongly the desirability of allowing the head to mould by the natural forces, assisted by Walcher's posture, in the minor cases of contraction.

Herff (Basel) continued the subject by referring to 413 cases of narrow pelvis, with a conj. vera under 10 cms., where 87·8 per cent. living children were discharged from hospital. Those good results are mostly obtained by induced premature labour. The infantile mortality was = 8 per cent. ; maternal, 1·3 per cent. Of the latter nine fatal cases, four were due to rupture of the uterus, and two to sepsis.

Hofmeier (Wurzburg) stated that in his klinik contracted pelvis was met with in about 5·4 per cent. cases. From those, 375 children survived, 95 were still-born. Of the latter, twenty-four had died before delivery ; 71 = 16 per cent. died intra-partum. As the result of induced premature labour, relatively many children died, and Hofmeier prefers Cæsarean section when the pelvic contraction is marked. In the Wurzburg Klinik ninety-four prophylactic operations (forceps, turning, and induced labour) were performed, and six symphysiotomies and twenty-one Cæsarean sections for relative indications. In the former ninety-eight children, 25 per cent., died ; in the latter none of the children died. But of the latter twenty-seven operations, three mothers died (one, symphysiotomy ; one, pubiotomy ; one, Cæsarean section), while in the former series no mother died.

In the discussion which followed the reading of those papers, Walcher advocated pubiotomy if the pelvic contraction is found to be too great after labour has been induced. He described his method of performing pubiotomy, and referred to eight cases with one death from eclampsia. Herzfeld (Wien) advocated premature labour in cases with contracted conjugate down to 8 cms. Freund (Strassburg) finds the death-rate of children delivered by symphysiotomy and pubiotomy to be still very high. By careful observation of cases of narrow pelvis, even without any operative interference, the death-rate may be reduced. Krönig (Freiburg) warns against placing too much reliance on the patient's statements regarding past pregnancies, and believes that premature labour is often induced when, by waiting, a living child could be born at full time. In the Freiburg Klinik there are few operations performed for narrow pelvis. In 1000 cases only sixteen were operated on. In those cases premature labour and the high forceps operation are generally rejected. Veit holds that the induction of premature labour cannot be displaced by pubiotomy till the results of the latter operation are better known. v. Herff was the only speaker who favoured the high forceps operation ; pubiotomy he regards as of use in an emergency, when the induction of premature labour has been unduly delayed or found impracticable. The general result of the discussion appeared to point to the undesirability of the operation of induced premature labour being displaced by pubiotomy or symphysiotomy.

Osteomalacia in Westphalia.

Everke (Bochum) stated that in twenty years' practice he had met with thirty-two cases. All except two occurred in Bochum, whilst in the rest of Westphalia the disease was practically unknown. All the patients were multiparous women, and the disease had become aggravated after each confinement. In fifteen cases, Everke removed the ovaries, and of the eleven that recovered from the operation the results were excellent. In slight cases he recommends the phosphorus treatment. Krönig referred to a case where he removed both ovaries from a young patient, but immediately transplanted them on to a pouch of peritoneum. The good result was immediate, but with the return of menstruation some months later symptoms of osteomalacia returned, and were only relieved by administration of large doses of phosphorus. Freund reported a non-puerperal case treated by castration without success, and a puerperal one where the good results were maintained ten years later. In a third case, Freund performed Cæsarean section, and endeavoured to excise the corpus luteum verum (Fränkel's theory); but, on account of the friability of the ovary, he had to remove it entire. The result was satisfactory.

Tuberculosis and Pregnancy.

Veit pointed out that this combination was not so serious for the patient as was generally considered. The course of pregnancy was rarely interrupted, and the indications for so doing never existed if the patient gained weight, which it is important to maintain. In cases where there is a steady loss of weight, pregnancy generally terminates prematurely, or the patients die soon after confinement.

In cases where the weight shows irregularity, sometimes increasing and decreasing, and then remaining for a time stationary, Veit recommends induction of labour as the only means of relief. Krönig places more importance on the changes in physical signs than on variations in weight. Freund believes that in cases where the tubercular process is not active, pregnancy goes on undisturbed, and the lung trouble seldom gets worse. If the local manifestations become aggravated, especially if complicated with laryngeal tuberculosis, the induction of abortion is justifiable.

THERAPEUTICS.

UNDER THE CHARGE OF

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The Therapeutic Value of Antithyroidin in the Treatment of Exophthalmic Goitre and Kindred Affections.

Elsher and Wiseman state that, in considering the efficacy of this drug, it must be remembered that the disease shows a marked tendency to remission in severity of symptoms, and that this freedom may last for a long time. They are convinced that antithyroidin can be used for the relief of symptoms in all forms of the disease. The greatest improvement is obtained in the relief of tachycardia, praecordial distress, and tremor. This improvement is hastened by rest in bed and suitable diet, but rest and diet alone do not give the same degree of improvement. The relief under antithyroidin treatment is rapidly obtained, usually within a week of the commencement of treatment; but if no improvement is obtained within the first three or four weeks, not much good is likely to result from further use of the drug. In those cases where antithyroidin results in the disappearance of subjective symptoms, it will be wise to use the drug in subsequent courses of from four to eight weeks, at intervals of two or three months. The class of case which yields most readily to the treatment is that in which there is slight exophthalmos and tremor, without marked goitre. The thyroid gland shrinks, but does not return to the normal size. The exophthalmos is the most rebellious symptom, and never completely yields to the treatment. The nervous symptoms usually improve as the circulatory disturbance passes off. The majority of the patients increase in weight. Patients who have had a course of antithyroidin willingly resume it, and in no instance has it done any harm, even in pregnant women. Hypertrophy, or dilatation of the heart, does not contra-indicate its use. The dose in ordinary cases is from 15 to 30 minims, morning and evening, in raspberry syrup or syrup of orange peel. In patients in whom this dosage fails to do good, the authors have increased the dose to 40 or even 60 minims. While at present the chief value of the treatment consists in the relief of distressing symptoms, the authors hope that in the future it may be further improved, and result in definite cure of the disease.—*N.Y. State Journ. Med.*, N.Y., 1906, June.

THE USE AND ABUSE OF PULMONARY GYMNASTICS IN THE TREATMENT OF TUBERCULOSIS.

MINOR holds that pulmonary gymnastics are of great value in pulmonary tuberculosis. By their use it is possible to improve the form of the thorax, and re-expand contracted, but not yet involved, areas of lung. They may be used as a prophylactic measure—(1) In childhood, where, on account of a bad heredity, or from other reasons, a maximum development of the lung capacity is called for; or (2) in badly shaped chests, to restore or improve the shape; (3) after illnesses which tend to limit the pulmonary capacity, as after pneumonias with slow resolution, or in pleurisy. The curative use should not include cases of florid phthisis and caseous pneumonias, or acute miliary tubercle. But regular pulmonary exercises are specially indicated in incipient cases, or those only moderately advanced, with localised or slightly disseminated inactive lesions, with temperature not over 99·4 and pulse not over 100, with or without tendency to shrinkage of the chest, narrowing of the shoulders, and stoop, or with small inactive dry cavities or slight dry pleurisies. On the other hand, advanced cases, or those with generally disseminated lesions or active or multiple cavitation, or with old advanced fibrosis, or with fever, rapid pulse, and tendency to activity, should be entirely excluded. In general terms, no gymnastics should be used in cases with numerous dry râles, or with moist râles or small areas of active broncho-pneumonia. No special apparatus is required. The following simple procedures are quite sufficient:—Simple, quiet, deep breathing, with shoulders erect, the patient either sitting or standing. Forced breathing, aided by arm raising and lowering in a transverse vertical plane, inspiring as the arms are raised, and expiring as they fall, holding the breath while the arms are over the head. Or the arms may be moved in an antero-posterior horizontal plane, inspiring as the arms go backward, and expiring as they come forward. Corner exercise may also be combined with deep breathing. The patient places the hands about two feet from the angle formed by two walls, falling inward with inspiration, and pushing outward with expiration. In incipient cases with no fever nothing is so efficacious as Indian club exercise, with the ordinary figure-of-eight swing. The inspiration should correspond with the small circle behind the back, and expiration with the coming down of the arm while completing the great circle in front of the body.—*Therap. Gaz.*, Phila., 1906, October.

The Action of X-Rays on Malaria.

In view of the excellent symptomatic effect produced by the X-rays in leukæmia, Demarchi investigated the action of X-rays in malarial infection. He has tested the effect in a large number of cases, and no definite action was observed upon the malarial parasites. The number, vitality, and cycle of development remained unaltered. In most of the cases the spleen was exposed to the rays, as probably forming the chief depository of the infective agent, but no diminution in the number of the attacks was obtained. On the other hand, as soon as the febrile attacks were checked by other treatment, exposure of the spleen to the rays resulted in a marked reduction in the spleen, and therefore it is possible that the ray treatment may tend to diminish the number of relapse attacks.—*Policlin.*, Rome, 1906, June.

Diuretic Action of Mercury.

Frey has investigated the diuretic action of mercury upon rabbits, and comes to the conclusion that the diuresis produced is of the same type as that caused by saline diuretics. That is to say, it is associated with dilatation of the glomerular arteries, and does not depend simply upon a diminished absorption of fluid while the urine is passing along the convoluted tubules. The dilating action is local in origin, and not due to a central stimulation, since it occurs even if all the nerves to the kidney are severed. With continued use of mercury, the vaso-dilatation gives place to a vaso-constriction, and then the excretion of urine falls.—*Arch. f. d. ges. Physiol.*, Bonn, 1906, October 22.

The Tolerance to Arsenic.

Hansemann has obtained very definite tolerance in dogs fed by the mouth with solid arsenious acid. He has investigated the excretion, and finds that at first about 70 to 80 per cent. of the arsenic taken is excreted in the fæces. Subsequently the fæcal excretion falls to 29 per cent., but the urinary excretion remains fairly constant, at from 2 to 5 per cent. The amount hitherto excreted by the fæces he is thus unable to trace. Possibly it is altered into some innocuous compound, which escapes detection with our ordinary tests. As such it may either be excreted or remain stored up in the tissues. He considers it certain that this transformation is the result of cellular activity, which robs the arsenic of its toxic action, probably by an action analogous to that whereby the tissues obtain immunity against foreign toxins.—*Arch. f. d. ges. Physiol.*, Bonn, Bd. xiii. Hefte 5 and 6.

PATHOLOGY AND BACTERIOLOGY.

UNDER THE CHARGE OF

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The Opsonic Index and the Antipneumococcal Power of the Blood in Pneumonia.

Wolf (*Journ. Infect. Dis.*, Chicago, 1906, vol. iii. No. 5) studied eleven cases of pneumonia by estimating the opsonic index of the blood daily before the crisis in typical cases and less frequently thereafter. The series included two cases of pneumococcal empyema and two cases of migratory pneumonia, two fatal cases of pneumonia, while the remaining five were cases of typical lobar pneumonia terminating in crisis. Leucocyte counts and blood cultures were also made. After trying various quantities, 0·025 c.c. was chosen as the most suitable quantity of pneumonic serum to be taken. It was made up to 0·2 c.c. with normal saline. The culture of pneumococcus used was isolated from the blood of a pneumonia patient three months before. The number of organisms in at least twenty leucocytes was counted in each case. The opsonic index is first decreased. It remains below normal till a few hours before crisis (the negative phase), and then rapidly rises in favourable cases, reaching its height twenty-four hours after crisis, when decline towards normal takes place. In fatal cases it remains persistently low. Notwithstanding the pneumococco-opsonic index being low, the antipneumococcal power of the blood may be 3½ times the normal owing to the great increase in the polymorpho-nuclear leucocytes. It remains high until crisis is complete in cases with favourable termination. Pneumococcal exudates contain little or no pneumococco-opsonin, nor do they exert any antiphagocytic action. Dead virulent pneumococci produce a similar evolution in the antipneumococcal index in normal persons to that which occurs in pneumonia. Dead avirulent pneumococci have no effect on the pneumococco-opsonins. Fourteen cases of lobar pneumonia chosen at random were treated by injections of pneumococcal vaccines, and eleven of them recovered, the other three ending fatally. The evolution of the course of the disease was precisely that of a case untreated, with the exception that crisis seemed to occur early. There was also an apparent decrease in mortality, but too little work has been done on the subject to justify conclusions of value on this point.

PHAGOCYTOSIS OF RED CORPUSCLES.

HEKTOEN (*Journ. Infect. Dis.*, Chicago, 1906, vol. iii. No. 5) investigated the factors underlying erythro-phagocytosis. He quotes Sawtchenko's view that it depended upon the action of the amboceptor or "substance sensibilisatrice" in the immune serum upon either the phagocytes or the erythrocytes. Neufeld and Töpfu (*Centralbl. f. Bakteriol. u. Parasitenk.*, Jena, 1905, Origin. 37, S. 456) showed that this substance, which they designated as hemotropic, had no direct action on the leucocytes. Hektoen himself (*Journ. Am. Med. Ass.*, Chicago, 1906, No. 46, p. 1407) showed that such substances should be called opsonins (hemopsonins) because of their analogy to the bacteriopsonins of Wright and Douglas, who were the first to show clearly the opsonic power of the serum in phagocytosis of bacteria. The hemopsonins are distinct from the amboceptors and agglutinins, because a serum may be lytic or agglutinating but not opsonic, and *vice versâ* with respect to certain erythrocytes. The observations included the blood of the goat, dog, sheep, guinea-pig, rabbit, chicken, man, etc., and of these the phagocytosis of human erythrocytes by human leucocytes is perhaps the most interesting. He studed this *in vitro*. Small quantities of citrated human blood from various sources were washed three or four times in liberal quantities of NaCl solution by means of centrifugalisation; in order to secure as many leucocytes as possible, the superficial layers of the sedimented blood corpuscles, the "blood cream," are made into a thick suspension in salt solution, and 0·1 or 0·2 c.c. of this suspension is mixed with an equal quantity of the serum, the opsonic effect of which is to be determined; this mixture is then placed in the incubator at 37° C. for forty minutes, when smears are made and stained. In no case was phagocytosis observed in mixtures of washed fresh blood cream and salt solution only, serum being essential for phagocytosis. Erythrocytes may take up the active substance—hemopsonin—from the serum, and in so doing they become susceptible to phagocytosis by washed leucocytes after every trace of serum has been removed by repeated washing. If sufficient erythrocytes of the proper kind are added, all the opsonin may be removed from the serum. Hektoen summarises his results as follow: (1) Normal serum may contain opsonins for heterologous, and in some instances also (human serum) for homologous erythrocytes. (2) Repeated injections with alien blood commonly give rise to the accumulation of hemopsonins in the blood. (3) Immune hemopsonin serum may contain common or non-specific hemopsonins as well as specific hemopsonins, directed particularly against the corpuscles of the blood employed for the injection. (4) Immune hemopsonins possess a high degree of resistance to heat and other influences. (5) Hemopsonins render red corpuscles susceptible to phagocytosis by various leucocytes, including the homologous, but the phagocytic activity of different leucocytes toward opsonised erythrocytes may vary. (6) Human serum may contain agglutinin and opsonin for human erythrocytes. This appears to be the case especially in typhoid fever. The corpuscles of various individuals vary in their susceptibility to agglutination and phagocytosis by human leucocytes, and the phagocytic power of leucocytes may vary. Auto-agglutinins and auto-opsonins appear to occur. (7) The demonstration of opsonins for human corpuscles in human serum may lead to a better understanding of the phagocytosis of erythrocytes in infectious and other processes.

NEUROTOXINS.

ARMAND DELILLE (*Ann. de l'Inst. Pasteur*, Paris, 1906, October 25, p. 338) gives his results with injections of cerebral substance. He points out that the discovery of hemolytic serums by Bordet, and of spermotoxin serums by Metchnikoff, has drawn the attention of biologists generally to other cytotoxins which may be obtained by the injection of the pulp of different bodily organs. M. Delezenne (*Ann. de l'Inst. Pasteur*, Paris, 1900, p. 686) showed that if cerebral substance be pulverised and washed and then injected repeatedly into an animal, a serum can be obtained from that animal which, if injected into the nervous tissues of another animal, will produce convulsions or coma, followed by death in a few hours. He injected some of the cerebral substance of a dog into a duck, and obtained from it a serum which was strongly neurotoxic for the dog. All his results did not tally, as both he and other observers were puzzled by certain contradictory results, which are mostly regarded as idiosyncrasies. Centanni (*Riforma med.*, Roma, 1900, November 7) obtained in a similar manner a neurotoxic serum from a ewe which had during seven months received intraperitoneal injections of the brain of a rabbit. In doses of $\frac{1}{2}$ c.c. this serum killed a rabbit in forty-eight hours when injected into its brain, whereas intravenous injection was harmless. By repeating the intravenous injections he got a serum which antagonised the other, *i.e.* an antineurotoxin. Of all the results got by various writers in this field, Pirone's (*Arch. de sc. biol.*, St. Petersburg, 1903, September, tome x.) are the most interesting. He repeated Delezenne's experiments in ducks, and got the same results, and, further, studied the histological changes produced by the neurotoxin in the brain of the dog. In a dog which died ten hours after injection with a neurotoxic serum, he found intense dilatation of the vessels, great leucocyte emigration, extreme chromatolysis of nerve cells, and destruction of whole neurones. Delille used geese, ducks, dogs, guinea-pigs, etc., and concludes that neurotoxins cause not only an intoxication of nerve centres, as shown by convulsions or twitchings, and coma or depression, mostly ending in death, but also characteristic histological changes which may be summed up as a neurolysis, comparable to the hemolysis caused by a hemoserum. He believes that the active agent is a true cytotoxin, because its results are got when injections of cerebral substance of one animal are injected into the body of another animal, and its serum then injected into the brain of an animal of the same species from which the original substances for injection were taken, *i.e.* that it is a veritable *neurotoxin.*

THE TRYPANOSOME OF THE MOUSE. CYCLE OF DEVELOPMENT IN THE FŒTUS.

ANTOINE PRICOLO (*Centralbl. f. Bakteriol. u. Parasitenk.*, Jena, 1906, Origin. 1, Bd. xlii. SS. 231–235) has found that 40 per cent. of the grey mice captured in the laboratory Gosio in Rome harbour a trypanosome probably identical with that of Thiroux. The severely infected mice die shortly after their capture in an anæmic condition, and with serous pericardial effusion. White mice can be infected by inoculation with the infected blood of the grey mouse. The trypanosome can pass through the placenta. This is an exception to the general rule that trypanosomata cannot do so. It can multiply in the fœtus, and the author has described and figured a series of forms illustrating its development under such conditions.

The Etiology of the "Diphtheria" of Birds.

Reiner Muller (*Centralbl. f. Bakteriol. u. Parasitenk.*, Jena, 1906, Origin. 1–46, June 14, SS. 423–426; June 23, SS. 513–523; and July 7, SS. 621–628) isolated, post-mortem, from two hens, a bacillus which closely resembles that described recently (*Ann. de l'Inst. Pasteur*, Paris, 1906, p. 411) by him in a case of sore throat with scarlatina-like rash. It also slightly resembles the true diphtheria bacillus. It did not grow on ordinary agar, but grew well on blood agar. He also describes its characters in a large number of media, *e.g.*, blood gelatin, serum agar, serum gelatin, milk agar, Löffler's medium, etc. By inoculation of pure cultures he reproduced the same symptoms and histological changes as characterise the spontaneous disease in hens. He could find no toxin in its growths. He proposes the name "Bacillus of diphtheria of hens" for it.

DERMATOLOGY.

UNDER THE CHARGE OF

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Pigmentary Form of Paget's Disease, and a Theory of Cancer of the Breast.

Audry (*Ann. de dermat. et de syph.*, Paris, 1906, June) has had a case of Paget's disease presenting quite unusual features, which have led him to formulate a novel and ingenious theory of the origin of cancer of the breast. The patient was æt. 54, and in consequence of abscesses in the right mamma after the birth of her first child, she had not been able to nurse with it. Only six months previously the nipple and areola became red, oozing, then crusted, while the gland grew hard, but without pain. She had some pigmented nævi scattered over the face and abdomen. The right breast was not much larger than its neighbour, but felt hard and uneven. The nipple was scarcely raised above the areola, but both parts were red, glistening as if covered with a shining varnish, and showed a black mottling. This communicated with a somewhat warty black patch, and several similar ones were dispersed over the skin near, bearing a loosely attached crust. These latter, according to the statements of the patient, had but recently developed. Microscopic examination showed very imperfect keratinisation of the horny layer. Throughout the rete were found plentifully those "round bodies" described by Darier in this disease. The granular layer was thick, with abundant kerato-hyaline, but the mucous layer exhibited an acantholysis, the connecting cell filaments having disappeared, so that the individual cells were isolated. Here and there were small leucocytic collections. The basal formative layer could not be precisely recognised, and there was no pigment in that stratum. But at the extreme margin of the areola a new element was seen, namely, pigment, occurring copiously in circumscribed areas, but nearly always intracellular. The stained patches had an intact covering epithelium, but in the derma were wide lymphatic canals filled with neoplasm in form of polyhedric cells aggregated in long lines. The mammary tumours were of the ordinary scirrhous variety. As to the nature of Paget's disease, he adheres to the view that it is really an acantholytic epitheliomatosis, starting in the nipple and finally reaching the breast by the intermediary of the galactophores. He found the yeast organisms noticed by Fabry and Trautmann, but as these were restricted to the surface or the most external layers, he does not regard them as possessing any pathogenic value. Bearing in mind the researches of Dalous on senile nævo-melano-carcinoma, there is a striking analogy. The nipple is normally a pigmented organ, and here plays the part of nævus. Again, it is well known that soft, symmetrical, and bilateral pigmented nævi are often located on the mammary line, which are nothing else than supplementary nipples more or less recognisable in different cases. There is nothing in embryology opposed to this, provided we accept Unna's ectodermic theory of nævo-carcinoma. We may, in fact, regard not only the nipple but also the mammary gland as adaptations of systematised and symmetrical nævi. "If, again, we study as we ought the signification of the term nævo-carcinoma, if we remember the importance and frequency of carcinomata having for their point of departure, clinically, these soft nævi, if we recall to mind that these tumours of nævic origin have a reticulated and carcinomatous structure entirely distinct from other cutaneous epitheliomata, we will be forced to ally cancer of the breast and cutaneous cancer of nævic origin, and to conclude that cancer of the breast must be regarded as a cutaneous nævo-carcinoma."

THE TREATMENT OF SARCOMA BY THE X-RAYS.

THE unsatisfactory results of surgical measures, and the entire failure of internal remedies in the treatment of sarcoma, have led Kienböck (*Allg. Wien. med. Ztg.*, 1906, Nos. 27 to 34) to collect and analyse the published cases where the X-rays have been used, in order to arrive at some definite conclusion as to their value. While positive deductions are yet unattainable, he has been able to formulate some valuable inferences. Thus, taken all over, the exposures produce local and general effects. In favourable cases there is diminution of the tumours, healing of ulceration, and cessation of pain. The health improves, the strength increases, the appetite is keener, and the sleep more sound, while the anæmia lessens and the weight rises. These may be explained, inasmuch as by restraint on the growth of the sarcoma the production of harmful products and their entry into the blood is prevented. On the contrary, intermittent feverish attacks may occur, due apparently to toxæmia associated with very rapid diminution of the swellings after powerful exposures. The proportion of successes and failures is difficult to estimate ; he is inclined to place it at three to one. The failures may in some instances have been owing to the irradiations having been too slight. Variety in histological structure does not seem to affect results. The best suited are those growths which are superficial, of soft consistence, taking origin from the skin or lymphatic glands, and growing rapidly. As to permanence of cure, sufficient time had not elapsed in many since the terminations of the exposures, yet it can be affirmed that it is possible completely to cure sarcoma by the X-rays. On the other hand, we are not entitled to assume that they exert any injurious influence on sarcoma, and in consequence through fear of this to be deterred from trying them. In most cases trial should be made of them previous to operation, where at least there is not room for anxiety that delay for a few weeks would be prejudicial. They are especially indicated in cases of inoperable sarcoma. The rapid method, using the measures now at our disposal for measuring the quality and quantity of the rays, by relatively long exposures and suitably protracted intervals, is to be preferred. By it slight X-ray dermatitis with erythema and pigmentation may arise. Observation of the case must determine how long to persevere. If three months' treatment proves ineffectual, it is time to abandon it. Should the tumour completely absorb, prophylactic exposures, at considerable intervals, should be given.

IDIOPATHIC CUTANEOUS ATROPHY.

RUSCH has, in a long and exhaustive article (*Arch. f. Dermat. u. Syph.*, Wien, 1906, Bd. lxxxi. Hefte 1, 2, 3), discussed this question. His conclusions are that under the names of diffuse and circumscribed cutaneous atrophy, of erythema paralyticum, of erythromelia, of acrodermatitis chronica atrophicans, and of pityriasic erythrodermia in disseminate patches, are described diseased conditions nosologically allied. Pospelow has aptly compared the skin which has undergone this modification to "crumpled cigarette paper." The cause lies in a combined inflammatory and atrophying process. Inflammation and atrophy are to be regarded as co-ordinating, yet up to a certain degree disconnected. They take part in the production of the integumentary changes in very different proportions both quantitatively and qualitatively, but these variations must be mainly referred to temporary and local factors. From the clinical standpoint we must distinguish two types not sharply separated but with many transition forms. There are, first, cases in which inflammation is only anatomically perceptible, and which, macroscopically, from the beginning and during the entire course of the disease, present the picture of idiopathic tissue absorption. There are, secondly, cases in which the inflammatory symptoms (infiltration, œdema) preponderate over the atrophic, particularly in the early stages, so that the objective evidences of atrophy remain more or less in the background, sometimes completely or only noticeable in the advanced periods. A reddening of the skin due to vascular dilatation is the most constant phenomenon in all the forms. The disease seems in every instance to last throughout life, but the atrophic and inflammatory characters show remissions and exacerbations. The fully developed diseased conditions neither permit of perfect restoration nor of true scar formation.

Arsenic in Pityriasis Rubra Pilaris.

Heidingsfeld (*Journ. Cutan. and Genito-Urin. Dis.*, N.Y., 1906, August) thus sums up a well-written paper on this subject. Pityriasis rubra pilaris (Devergie) possesses a definite entity in the minds of the majority of dermatologists. Some attribute to it an identity with lichen ruber acumitatus (Kaposi). Its position is, therefore, still *sub judice*. Lichen planus, lichen verrucosus, and lichen acuminatus are at the present day given a common relationship, the two latter being regarded as subforms of lichen planus. All are reputed to be favourably influenced by arsenical treatment in every form, a clinical fact which serves many to definitely remove lichen acuminatus from pityriasis rubra pilaris. The latter disease is regarded to be unfavourably influenced by arsenical treatment in any form. Experience in three cases conforms to this in respect to the internal administration of arsenic and the hypodermic injections of sodium arseniate. The disease is favourably influenced by hypodermic injections of atoxyl and, to a lesser extent, by cacodylic acid. Lotions of tar, dietary regimen, and internal antiseptics are very useful adjuvants. Pityriasis rubra pilaris is, from a clinical and therapeutic standpoint, well differentiated from lichen ruber acuminatus. It is essentially a folliculitis, and the chief pathologic change is an intrafollicular keratosis. In one case, in which the pathological examination was made during the clinical stage of keratosis follicularis, hair follicles were found in various stages of extrusion upon the free surface of the skin, which constituted a unique pathologic finding. Contrary to the observations of some authors, the arrectores pilorum are constantly in a state of hypertrophy, which is in natural accordance with the clinical symptoms, rigor and cutus anserina, which accompany the affection.

DISEASES OF CHILDREN.

UNDER THE CHARGE OF

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Periodic Vomiting with Acetonæmia in Children.

In this article (*Brit. Journ. Child. Dis.*, London, 1906, March, p. 96) Vincent Dickinson gives a description of the condition, and reviews the various theories regarding its causation. It was first recognised in America in 1893, and since then numerous articles have been written on the subject under the varying nomenclature of gastric neurosis, persistent vomiting, periodic vomiting, cyclical vomiting, and vomiting with acetonæmia. The condition sets in suddenly in the midst of perfect health and without appreciable cause or error in diet, and the child, who is usually of a nervous or arthritic diathesis, is suddenly seized with vomiting. The vomiting is of the cerebral type, occurring suddenly and without any premonitory nausea. The vomited matter is usually of a watery character at first, but sometimes becomes bilious, or even fæcal, at a later period. Attacks of this character recur several times for four or five days, when they cease as suddenly as they started, and convalescence is at once established. Some symptoms of exhaustion may remain for a day or two, but the child speedily regains his spirits and colour, and is soon as well as ever he was. After a variable interval of time, varying from several weeks to a few months, the attacks of vomiting are renewed, with the same symptoms, and they may continue doing so for years, disappearing completely about the time of puberty. Associated with the vomiting there is, as a rule, severe prostration, the child lying motionless in bed, its face pale and drawn, the eyes sunken, and the abdomen retracted. The tongue is clean, there is no gastric pain, but there is often constipation, an accelerated pulse, and a temperature varying from 100° F. to 102° F. There is generally great thirst, but the child does not drink, as the least quantity of fluid is very apt to start an attack of vomiting. Although very little fluid is taken, the child ejects a large quantity of liquid by vomiting, thus dehydrating the organism and explaining the intense thirst. The appetite is always retained, which is a most important point in the diagnosis. The urine is scanty, and on analysis shows a definite amount of acetone, and often also of indican. The analysis for the detection of acetone should be made daily, as the time of its occurrence varies, sometimes making its appearance early and sometimes late in the attack. The breath also has a distinct odour of acetone, sometimes so marked as to be noticeable by any one entering the sickroom.

Numerous theories have been advanced regarding the causation of this condition. Comby believes that it is an evidence of a gouty diathesis, and that the attacks bear a strong resemblance to those of migraine; while Edsall ascribes it to a hyperacidity of the gastric juice producing grave acid intoxication of a type frequently met with in diabetes mellitus, and whose origin cannot be precisely defined. Griffiths supports the theory that it is a gastric neurosis of toxic origin, produced by profound metabolic disturbance; while Ricardière and Hutinel maintain that the attacks are of hepatic origin, believing that in these cases the liver no longer destroys or prevents the formation of acetone in the system. The diagnosis, as a rule, is easy if we bear in mind the sudden onset of the vomiting without traceable cause, the preservation of the appetite in spite of the alarming general condition, and the smell of acetone in the breath and its detection in the urine. The only two conditions which might be mistaken for it are tuberculous meningitis and bilious vomiting, but by the exercise of a little care both of these maladies are easily eliminated.

The prognosis is almost invariably favourable, but if a fatal result should supervene, which is most unusual, it is generally due to complications, the most frequent being nephritis. The treatment which has proved most efficacious is the administration of an alkali such as bicarbonate of soda in large doses, 15 grs. every two hours.

Prolonged Remissions in Tuberculous Meningitis in Children.

The authors (*Presse méd.*, Paris, 1906, September 2, p. 560) publish three cases in which prolonged remissions occurred, all of them subsequently succumbing to a recurrence of the disease. In these cases the symptoms and subsequent course of the illness presented the ordinary clinical picture of tuberculous meningitis until the final stage was reached, when, instead of gradually lapsing into coma and paralysis, the child slowly recovered. Analysis of the cerebro-spinal fluid, of which the tuberculous character had been confirmed by inoculation, showed a diminishing number of lymphocytes and an increase of polynuclear cells. The periods of remission lasted respectively four and a half, five, and nine months. During this period all the symptoms disappeared, and the child regained its former body weight, but in all of them it was noticed that there were symptoms of cerebral irritation, such as squint, weakness of the pupil reaction, nystagmus, slight tremor, while in others the mental condition was unsatisfactory. The children continued peevish and irritable, ceased to display evidences of affection, and assumed a mental state of unaccountable depression and sadness. After the intervals of remissions stated, and without any appreciable cause, all the classical symptoms of tuberculous meningitis reappeared, and resulted in coma or death in the course of a short time. In one case the autopsy showed tubercle in two stages of development; in one stage recent yellow granulations, and in the other areas of meningeal thickening and sclerosed tissue. Apparently the primary lesion tended towards sclerosis and cure, but the sclerosed tissue remained as an irritant, and ultimately acted as the starting-point of the more recent inflammatory attack. These cases point to the possibility in some cases, under favourable conditions, of a definite cure of tuberculous meningitis being obtained.

Early Diagnosis of Measles.

Brelet (*Arch. gén. de méd.*, Paris, 1906, p. 669) draws attention to two signs which during the incubation period are of value in forecasting the probable supervention of measles. The first of these is Meunier's sign, consisting in a marked loss of weight, which usually takes place towards the third, fourth, or fifth day in children incubating for measles, and about ten days before the eruption appears. This loss of weight averages about 60 grms. a day. As the author points out, a similar loss of weight may occur in children during the incubating period of other infectious diseases, so that it is not characteristic but merely suggestive of the onset of an infection. It is of special value in institutions where children have been exposed to the infection of measles, for by weighing them every day a marked loss of weight will indicate the cases likely to develop measles. The second sign is an increase in the number of leucocytes, especially the polynuclear forms. This leucocytosis begins with the incubation period, rapidly increases, and attains its maximum about the sixth day before the appearance of the rash, the leucocyte count being then about three times the normal. From this period diminution occurs, and by the time the rash appears there is usually a hypoleucocytosis present. Amongst other well-known signs, special mention is made of Koplik's spots. They appear three days before the eruption, and the writer asserts that they are present in from 80 to 100 per cent. of the cases. Their presence during the stage of invasion before the appearance of the rash makes the diagnosis of measles certain.

The Relationship of Weight to the Measurements of Children during the First Year.

The following is a brief abstract of an elaborate paper by Fleischner (*Arch. Pediat.*, N.Y., 1906, October, p. 739) on the above subject:—

The height and circumference of the head, chest, and abdomen in normal, well-nourished children increase with the weight, the greatest increase in those measurements occurring during the first quarter of the year when the greatest gain in weight takes place, and the least increase in the measurements occurs during the last quarter of the year when the gain in weight is least. It is in the poorly nourished children that age plays its most important part, and the measurements of those children increase most rapidly during the last part of the year, being in marked contrast with what occurs in the well-nourished. In poorly nourished children, when the weight is below normal, all the measurements are correspondingly under the standard, but the height and circumference of the head reach their normal measurements ahead of the weight. When the weight is stationary, the increase in the measurements is very small, depending upon the slight influence which age has upon the growth of the infant notwithstanding the weight. The measurements of infants of the same weight, notwithstanding the age, are very similar, the small difference depending, as when the weight of a child is stationary, upon the very slight influence of age upon growth.

The final conclusion can be drawn that during the first year of life the primary factor in the increase of the measurements of the body is steady, consistent increase in the weight, the influence of age being secondary and much less important.

REPORTS OF THE MEDICAL SOCIETIES.

Edinburgh Medico-Chirurgical Society.—*Wednesday, December 5, 1906.*—Dr. J. O. Affleck, President, in the chair.—Dr. W. G. Sym and Mr. Caird showed a patient after Krönlein's operation.—Dr. W. G. Sym showed a patient after enucleation of both eyes for glioma.—Mr. Paul showed a patient after primary suture of ruptured tendo Achilles.—Dr. Byrom Bramwell showed a case of fracture of the base of the skull, with complete blindness of the right eye, due to injury of the right optic nerve.—Mr. Caird showed—(1) Two patients after removal of naso-pharyngeal fibrous polypus; (2) a patient with injury to the elbow and contraction of the flexor muscles (Volkmann's ischæmic contracture ; (3) specimens of naso-pharyngeal polypi.—Dr. Byrom Bramwell read a paper entitled "The Present Position of the Tuberculosis Question in Scotland, with special reference to the recent Circular of the Local Government Board." At the outset reference was made to the prevalence in Scotland of phthisis and other forms of tuberculous disease, and to the necessity for a combined effort on the part of the public, the profession, and the public authorities, in order to deal effectively with the disease. During the thirty years 1871 to 1901 the death-rate from phthisis for the whole of Scotland had diminished considerably. There had been no decrease in the death-rate in the insular rural districts, probably because of the insanitary conditions prevailing. Dr. Bramwell then referred to the crusade against phthisis in Scotland. The disease is now recognised as infectious, and therefore compulsory notification is necessary if it is to be effectually dealt with. Phthisis, however, differs from other infectious diseases, and it is not necessary to remove cases to hospital or to isolate them. The main thing is to see that each patient suffering from phthisis destroys the sputum, and so render his case non-infective. If this be done, there is no reason why the patient should not mix freely with his fellows without there being risk of infecting them. Certain clauses of the Public Health Act of 1897 are far too drastic as applied to phthisis, and should be amended. In the discussion which followed, the circular of the Local Government Board was rather severely criticised.

EDINBURGH MEDICO-CHIRURGICAL SOCIETY.—*Clinical Meeting in Royal Infirmary.—December* 19, 1906.—Professor GREENFIELD in the chair.—Specimens were exhibited by Professor ANNANDALE, Mr. CATHCART, Mr. COTTERILL, and Drs. BRUCE and PIRIE.—Mr. COTTERILL showed—(1) A patient suffering from lympho-sarcoma of the neck; (2) a patient after operation of decompression for brain tumour.—Dr. BRUCE showed—(1) Two patients with symptoms of hæmorrhage into the optic thalamus; (2) two patients with extensive anterior poliomyelitis; (3) two patients with progressive primary myopathy; (4) a patient suffering from disseminated sclerosis, with marked intention tremors.—Dr. BYROM BRAMWELL showed—(1) A case of thrombosis of the pons; (2) a case of loss of the stereognostic sense, the result of an injury to the head.—Mr. CATHCART showed—(1) A patient after removal of the Gasserian ganglion; (2) a patient after removal of tumour of the kidney.—Mr. ALEXIS THOMSON showed—(1) A man, æt. 45, after incision and drainage of a mesenteric cyst; it contained semi-fluid material of the colour of café-au-lait, with fat droplets and cholesterine; the cyst wall was partly calcified. (2) A man, æt. 47, after incision, packing, and drainage of an enormous bleeding cavity in the right hypochondrium, believed to be due to an acute hæmorrhagic pancreatitis.—Mr. DOWDEN showed a series of cases of fracture about the elbow joint.—Dr. MACKAY showed cases from the eye wards.—Dr. RAINY showed a case of paralysis agitans, exhibiting several unusual symptoms.—Dr. PHILIP showed—(1) A case of chylous ascites; (2) a case of extreme dyspnœa treated by Béraneck's tuberculin; (3) a case of tuberculous glands treated by tuberculin.—Mr. SCOT SKIRVING showed—(1) Two patients after operation for ruptured gastric ulcer; (2) a patient showing peculiar ulcer of the leg rebellious to all treatment, including free excision.—Dr. GIBSON showed a case of Landry's paralysis, and also demonstrated Erlanger's sphygmomanometer.—Cases were also shown by Drs. CRANSTON LOW, EDWIN BRAMWELL, J. STRUTHERS, E. S. CARMICHAEL, and PEEL RITCHIE.

EDINBURGH OBSTETRICAL SOCIETY.—*December* 12, 1906.—Dr. N. T. BREWIS in the chair.—Dr. BREWIS read a paper on "Two Cases of Pregnancy, complicated by Fibroid Tumours and treated by Hysterectomy." In the first case the fibroid gave rise to urgent symptoms during the fifth month of pregnancy; in the second at full term. A living child was delivered by Cæsarean section in the second case, and in both cases the uterus was removed along with the tumour by hysterectomy.—Dr. HAIG FERGUSON read a "Note of a Case of Complicated Labour in a Primipara with one Kidney." Some years ago one kidney had been removed for disease. During pregnancy the urine was frequently examined, especially during the later months, and only a small amount of albumin was discovered towards the end of gestation. There were no untoward symptoms from this during labour, and the patient made an uninterrupted recovery. Dr. Ferguson discussed the risks in such cases, and thought that marriage should not be permitted for at least two years after nephrectomy, so that the kidney left might become accustomed to the extra strain thrown upon it. In conclusion, he referred to similar recorded cases.—The SECRETARY communicated a paper by Dr. GARNET LEARY on "Successful Treatment of Puerperal Fever by Antistreptococcic Serum." Dr. Leary recorded many cases in which he had used the serum, but he did not rely entirely on the serum, active local measures being also adopted.

GLASGOW MEDICO-CHIRURGICAL SOCIETY (FIFTH MEETING).—*December* 7, 1906.—Dr. JOHN ROWAN showed—(*a*) A case of cicatricial ectropion treated without operation; (*b*) a case of total symblepharon, causing complete blindness of the right eye for sixteen years, in which, after operative treatment had been carried out, almost full vision was obtained. The lids were freed, and the upper lid dissected off the globe. So far, the lower lid had not been raised, but the result had been highly satisfactory. Vision was now $\frac{6}{18}$, without correcting spectacles.—Dr. F. J. CHARTERIS exhibited tracings taken from a typical case of Stokes-Adams' disease—"heart-block"—and shortly sketched the main features of the condition, as present in the patient from whom the tracings were obtained. There had been fainting attacks for three years at frequent intervals. The normal pulse rate was about 28 per minute. The Stokes-Adams' syndrome was well marked. Epileptiform convulsions had recently developed, the fits being very frequent. Cheyne-Stokes breathing had supervened. An interesting point was that the periods of absence of pulse (sometimes as long as thirty-five seconds) did not synchronise with the periods of apnœa of the Cheyne-Stokes cycle.—Dr. CARSTAIRS C. DOUGLAS read a short note on "The Pancreatic Reaction of the Urine, and other associated means of diagnosing Disease of the Pancreas." Dr. Douglas expressed himself as having considerable confidence in the new form of the test, and cited illustrative cases in which he had recently employed it.—Dr. ROBERT KERR of Rabat (Morocco) then read a paper on "Some of the Prevailing Diseases in Morocco."

GLASGOW PATHOLOGICAL AND CLINICAL SOCIETY.—*December* 10, 1906. —The President, Dr. J. LINDSAY STEVEN, in the chair.—A recommendation from the Council, "That amalgamation of the Society with the Glasgow Medico-Chirurgical Society be considered," was discussed, and the subject was remitted to the Council to prepare a scheme.—Dr. GEORGE H. EDINGTON showed a specimen from a case of empyema, in which fatal hæmorrhage occurred from an erosion of the subclavian artery. The end of the drainage tube which was inserted at the operation was found to reach to the vessel wall, and corresponded with the aperture in the vessel, and he was of the opinion that this was the explanation of the occurrence of the hæmorrhage.—Dr. CARSTAIRS DOUGLAS described an improved clinical method for the estimation of the factors of gastric acidity, and demonstrated the tests. The tests were performed in three stages, with deci-normal soda solution, run in from a burette. First, titration of 10 c.c. of the filtered gastric juice with tropæolin oo for the free hydrochloric acid; subsequent treatment with dimethyl-amido-azo-benzol for the presence of the organic acids, and by phenol-phthalein for the total acidity; while the last reading of itself gave the combined HCl and acid salts. A second quantity of filtered gastric contents were treated with sodium-alazarin-sulphonate in water, and this gave the value of all the elements except the combined HCl. The value of the combined hydrochloric acid was thus obtained from the difference of the figures in the two estimations. Lastly, a fresh quantity after evaporation was treated with phenol-phthalein, and the reading obtained gave the total acidity less than that due to the volatile organic acids. The difference of this estimation and that obtained for total acidity represented the value of the volatile organic acids.

EDINBURGH MEDICAL JOURNAL.

EDITORIAL.

Alexander Peddie.

IT is not vouchsafed to many of the sons of men to cross the hundred arches of the bridge of Mirza. A few escape the "Gates of Death" until they have passed the seventy unbroken spans, but the numbers crossing the ruined arches steadily lessen as they, like the subject of the present notice, near the end of the visionary bridge. On high authority it has been asserted that the later years of such men are "but labour and sorrow," yet the career of the *doyen* of the Scottish medical profession shows that such a statement is not of universal application. The retrospect of a life remarkable for its usefulness and rich in its fulfilment, instinct with broad sympathies and devoted to wide interests, distinguished by generosity of thought and magnanimity of mind, could not fail to furnish peace and happiness, and this feeling was undoubtedly enhanced by the assurance, on all hands, of the universal love and respect of his fellow-countrymen.

Alexander Peddie belonged to the "Brahmin caste," as the Autocrat puts it, and was the son of an eminent minister in Edinburgh. Born in 1810, his earliest memories centred in the stirring scenes marking the decline and fall of the great Napoleon. At the High School he was a member of one of the large classes characteristic of the time: that to which he belonged included many men who afterwards attained distinction, all of whom passed away before him. On leaving school, he spent a few years in a bank, but, on the advice of Dr. Abercromby, he decided to study medicine, and became in 1830 an apprentice to Mr. Syme at Minto House, where he was associated with his lifelong friend, John Brown. Graduating at the University five years later, he repaired to the Continent, and devoted himself more particularly to study in Paris, whose medical school was then at the zenith of one of its most famous epochs. It is of interest to note that on his return to engage in practice, he was the first to introduce the stethoscope to Edinburgh.

In addition to engaging in private practice, Dr. Peddie, in combination with Dr. Brown and Dr. Cornwall, accepted the charge of the hospital at Minto House. From this time onwards until his retirement, a few years ago, Dr. Peddie spent an active life and enjoyed a large practice in his native city. He did not restrict his energies, by any means, to medicine, but allowed his wide sympathies free scope in many directions; his professional duties, however, were ever first in his thoughts. At all times possessed of an open mind, he was quick to detect any possibility of advances in knowledge. As a proof of this, it may be mentioned that he was the earliest to demonstrate in Edinburgh the animal parasites of skin diseases. In two other directions, at least, he was far in advance of his compeers. At a comparatively early period of his career he recognised the infectious nature of puerperal fever, and strove with all his energies to obtain wide recognition of the fact. His name thus deserves to be placed along with those of Oliver Wendell Holmes and Semmelweiss as one of the pioneers in a great advance. Some years ago Professor Osler wrote to ask Dr. Wendell Holmes whether he looked back with greater pleasure to his paper on "Puerperal Infectivity," or to the composition of the "Chambered Nautilus," and received, as might be expected, a reply in favour of the scientific advance rather than of the literary triumph. If a similar query had been addressed to Dr. Peddie — if he had been asked whether he would rather have his name associated in the future with a practical achievement, bringing in its train the saving of countless precious lives, or with the biography of his friend, which has delighted a large circle of readers, there can be no question as to what his answer would have been.

In another branch of medicine Dr. Peddie initiated beneficial changes. Impressed by the failure attendant upon attempts to deal with inebriates, he suggested views in regard to pathology and treatment far in advance of those at that time in vogue. Earnest consideration of the questions involved led him to the conclusion that inebriety is to be regarded as the outcome of cerebral disease, and he, therefore, proposed that the management of such cases should be based upon modern scientific conceptions. The practical outcome of his work in this direction has certainly been of the highest value.

Led by the results of wide observation to recognise the want of it, he was amongst the enlightened men who initiated the movement in favour of the institution of a hospital for children, and to his advocacy of the cause the foundation of the Royal Hospital for Sick Children is in great part due.

Dr. Peddie contributed numerous papers and articles upon these and many other subjects to medical literature, the largest number of which appeared in the pages of this Journal. These contributions are marked by breadth of view and originality of thought, while characterised by lucidity of style and purity of diction.

During his professional career many honours were bestowed upon him: he became President of the Royal College of Physicians in 1877 and of the Harveian Society in 1890. In this latter capacity he performed a pious duty by devoting the Annual Oration to a delightful sketch of the life of "Rab." This charming biography was afterwards extended, and will remain one of the most graceful tributes to friendship afforded by our profession.

In his personal character Dr. Peddie was one of the most lovable of mankind. This did not arise from weakness, for he was equally strong in defence of what he deemed right and in denunciation of what he considered wrong; it arose from his generous instincts and kindly ways. These traits were ever in evidence on his aristocratic features and in his steadfast eye; his expression was singularly winning as it reflected his changing moods from grave to gay; his bearing was a charming survival of a courteous past. Always fond of music, he possessed an excellent voice, and with Professors Christison, Bennett, and Maclagan, formed the quartet so popular in the rendering of glees. During his later years he showed a love for the brush, and produced water-colour sketches of much beauty.

In his long life he witnessed many changes in matters political and ecclesiastical as well as medical, and in all these he manfully played his part. Politically he was a Liberal of the old school, and he, therefore, on the great recantation twenty years ago naturally threw in his lot with the Unionist party. In Church matters he was to the last faithful to the principles of the Erskines, but acknowledging that the Scots Kirk had gained the freedom for which the Secession contended, he was as often in the parish church as in that to which he officially belonged. He was of opinion that the recent ecclesiastical adjustment in Scotland was practically a new version of the Revolution Settlement.

Reference has already been made to the class at the High School to which Dr. Peddie belonged: he remained on terms of close friendship with all his old schoolfellows, until one by one they dropped away. Not many years ago a gathering of the old class took place at the country house of Mr. John Ord Mackenzie of Dolphinton, and on that occasion the party of old comrades comprised Lord Inglis, Lord Moncreiff, Mr. Christopher Douglas, Mr. William Blackwood, and Sir Douglas Maclagan. It was proposed that an ascent of the neighbouring hill should be made, and Dr. Peddie, the oldest member of the class, was delighted to be able to reach the summit in advance of all the rest. He certainly could not be regarded as, in any sense, resembling the elderly subject of Crabbe's tale, who, to escape the fatigue of an ascent, says: "The view is poor, we need not climb." Fond at all times of physical exertion, he found in fishing his most congenial sport, and, as is well known, he killed a fish in his eighty-fifth year.

Since his retirement from active life one of Dr. Peddie's great pleasures was to talk over the past and compare it with the present. This was always done with a keen interest in all that made for progress; it never could be be said of him—

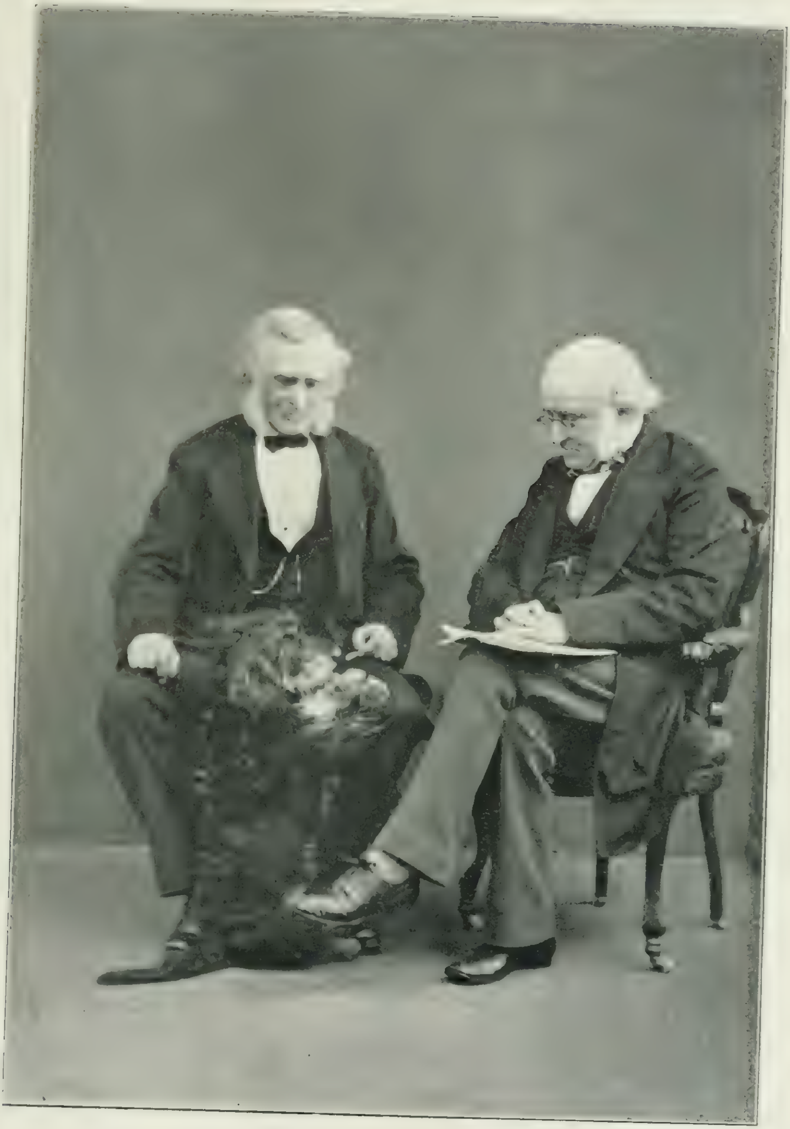
> "Et cum tempora temporibus præsentia confert
> Præteritis, laudat fortunas sæpe parentis."

During the present winter his strength has been gradually failing, but the immediate cause of his death was pneumonia, under which he quietly passed away on Saturday, 19th January, in the presence of his family. Four days later he was laid to rest in Warriston Cemetery beside his wife, who died a few years ago, and the large gathering of friends and colleagues testified to the widespread esteem in which he was held, as well as to the universal sympathy extended to his family.

Rectorial Addresses.

ASSUREDLY the ordinance which gives to students of Scottish Universities the privilege of electing triennially a representative on the Courts of these ancient Corporations is more than vindicated if it affords them, and for that part of the matter, the public generally, the opportunity of listening to two such addresses as have recently been delivered in Edinburgh and Glasgow. Whatever arguments may be urged against the introduction of politics pure and simple into University affairs,—and the election of Lord Rector has, with very few exceptions, proceeded on strictly party lines,—few will be found to deny that the choice of the undergraduates has always been justified, and that the swing of the pendulum has produced the happiest results.

It was indeed a fortunate chance which gave us on successive days two such eloquent orations as those of Mr. Haldane and Mr. Asquith. The curious parallelism which exists in the lives of the two Lord Rectors increases the interest with which their remarks will be read. Intimate friends for a generation, both attained the highest fame as members of the Bar of England, while both, entering politics by means of the suffrages of Scottish constituencies, have found themselves in the same Cabinet and simultaneously the recipients of the same honour in neighbouring Universities. We have been told by one who heard both addresses, that that of Mr. Asquith was the most eloquent and the finest oratorical effort, but we are not sure that those who have only had the opportunity of reading the addresses in print will be so inclined to award the palm. Both reached a very high level of excellence, and showed the fruits of ripe experience and deep meditation; both are full of sound advice, based on equally high



Dr. Alexander Peddie and the Author of "Rab and his Friends."
From a photograph by Moffat.

ideals,—but to our mind the words of Mr. Haldane, couched in no less eloquent composition, touch a chord which will be more responsive in the majority of students, and which more directly and practically deal with the problems of present University life.

Mr. Asquith made a strong appeal for a University not merely to rest satisfied with equipping its pupils so that they may outstrip their competitors in the crafts and professions. This is, he said, not the ultimate test of work or worth. A University will be judged by the influence it exerts upon the imagination and character, by the degree in which it has helped to raise, enrich, and complete the true life of man, or through him the composite life of the community. One sentence in the eloquent peroration appears to us to have a special application, or at least we may so accept it, to members of our own great profession: "We must take with us into the dust and tumult, the ambitions and cares, the homely joys and sorrows, which will make up the texture of our working days and years, an inextinguishable faith in the things that are unseen, the things which give a dignity to service, inspiration to work, purpose to suffering, a value immeasurable and eternal to the humblest of our lives."

Mr. Haldane was no less strong in his views as to the highest functions of a University and the influence which it ought to exert in preparing students to perform their duties as citizens. Taking his examples from Greece and Rome, the fall of the Turkish Empire, the rise of Japan, and the gradual extrication of Germany from the degradation into which she was plunged by Napoleon, he showed how much in national as well as in private life depends upon individuality and the cultivation of the moral and intellectual powers. In the development of such qualities Universities ought to play a great part, and there were few more telling passages in the address than those in which he traced the gradual evolution of Germany from a state of practical servitude at the commencement of last century to its present eminence as a result of the moral and intellectual influence of her Universities.

As the Rector pointed out, the life of the scholar makes more demand for concentration than any other life. If the ideal work of a University is to produce men of the widest minds,—men who are fit to lead as well as merely to organise,—he asks, what must such men set before themselves? The answer is to be found in a dedication of our lives, and he defines a dedicated life as one that is with all its strength concentrated on a high purpose.

On this subject Mr. Haldane had much to say, and much, we need hardly remark, which deserves to be taken to heart by students as well as by every one connected with our Universities.

To the former, however, to whom it was more particularly addressed, we venture to think that the appeal for the dedicated life has at present a special applicability. In recent years there seems to us to have been a gradually increasing dedication of the student's life to pursuits which are not intellectual, however good they may be physically and harmless in the strictly moral sense.

Mr. Haldane gives due warning that to even approach the dedicated life, social intercourse must be a means to an end, and that end the pursuit of the knowledge for which the student has come to the University. His aim must be to grow in mental stature and to enlarge his outlook. This does not indicate by any means that physical culture is to be neglected, far from it; but work is to be the main object, and to succeed one must throw one's whole strength into work.

"The way is steep and hard to tread for those who enter on it. They must lay aside much of what is pleasant and commonly sought after. They must regard themselves as deliberately accepting the duty of preferring the higher to the lower at every turn of daily existence. So only can they make themselves accepted leaders; so only can they aspire to form a part of that priesthood of humanity to whose commands the world will yield obedience."

Post-Graduate Classes.

THE next post-graduate course will be held during the month of September, and will extend to four weeks. It has been decided to make certain changes in order to meet the convenience of those attending it. Thus the chief classes will meet daily, and during the second fortnight many of them will be repeated. All practical classes will be strictly limited, and advanced courses will be conducted on certain subjects, such as bacteriology and diseases of the blood.

A composite fee of five guineas for the month, or three guineas for either the first or second fortnight, will be charged. We understand that the question of continuous post-graduate instruction throughout the year is at present engaging the attention of the executive committee.

ORIGINAL COMMUNICATIONS.

THE PROPHYLAXIS OF SCARLATINAL NEPHRITIS: OBSERVATIONS ON 300 CASES OF SCARLATINA TREATED WITH UROTROPINE, HEXAMETHYLENE-TETRAMINE, AND METRAMINE.[1]

By Herbert P. Thompson, M.D., *late House Physician, City Hospital for Infectious Diseases, Edinburgh.*

In this article I shall confine myself to recording the clinical observations that I made with hexamethylenetetramine and its proprietary representatives, urotropine and metramine, in the prophylactic treatment of scarlatinal nephritis. I have had access to the Edinburgh City Fever Hospital records from 1900 to 1906, and I paid particular attention to nephritis. But the cases to which I shall particularly refer were under my constant observation at the above hospital.

In every one of these cases the diagnosis of scarlatina was corroborated by Dr. Claude B. Ker, medical superintendent of the hospital, to whom I am deeply indebted for encouragement and permission to carry out my investigations.

There is no literature to the effect that these drugs have ever before been used in the British Isles for scarlatinal nephritis, or the prophylaxis thereof. It is true that one cannot dogmatise from the observations on 300 cases, but I think that the results obtained are of interest and, I hope, of some practical value.

I will not enter into a discussion as to the actual cause of scarlatinal nephritis, which is even yet a deep sea of speculation into which many have dived, some to return with a bacillus, and others with the more popular streptococcus.

Whether the nephritis be due to the organisms which are claimed to be the cause of scarlatina—and their name is legion—or to their toxins, or whatever be the cause, the fact remains that scarlatinal nephritis is a fairly frequent and a most unpleasant complication, which it should be our endeavour to relieve, or, better still, to obviate. If the kidney be irritated, there is a weakening of the powers of resistance, a local lowering of the vitality of the tissues affected, and so a permeability or break in the line of defence, and thus a suitable soil produced for a successful attack, at a later period, by the streptococcus, or whatever it is, that causes the nephritis.

There are doubtless many determining factors in the prevalence of scarlatinal nephritis, such as, errors in diet, a chill in the period of desquamation, the influences of race, sex, season, atmospheric and social conditions, and more especially age, and the type of the epidemic. Though these would probably not of themselves produce nephritis, yet some may be looked upon as predisposing, and others as exciting, causes, and must therefore be considered. If severe desquamation played an important part in the causation of scarlatinal nephritis, one would expect to see it early, and associated with early albuminuria, or late with nephritis. I had only one case of severe desquamation associated with nephritis. My experience has been that desquamation, *per se*, has very little to do with the causation of nephritis.

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[1] This paper is a synopsis of an M.D. thesis, which received commendation at Edinburgh University, 1906.

With regard to seasonal influence, there is something peculiar to the atmospheric conditions of the months of October and November that is particularly suitable to the growth and spread of the scarlatina virus and the increase of nephritis, along with the other complications. Then with reference to the age-period, I found that nearly all the cases of nephritis occurred between the ages of 3 and 8 years.

In 1903, 69·3 per cent. of the nephritis cases occurred between 3 and 8 years.
In 1904, 89·6 ,, ,, ,, ,,
In 1905, 65·1 ,, ,, ,, ,,

Of course, one bears in mind that a very large proportion of the cases of scarlatina occur in this age-period, but the nephritis percentage is too high between 3 and 8 years to be explained away by this fact.

The examination of the blood in scarlatina has not as yet proved of much value. Widowitz noticed that the hæmoglobin gradually diminished with the appearance of nephritis, or suddenly diminished in the event of an exacerbation of the nephritis.

The conclusions that I feel justified in forming as to the causation of scarlatinal nephritis are—

1. That it is, in all probability, the result of an irritation caused by (*a*) the organism of scarlatina itself, or (*b*) its toxins.

2. That it may be the result of a secondary streptococcal invasion, the success of which has been promoted by an irritation, and a local weakening of the powers of resistance on the part of the renal tissues, and so providing a suitable soil for an invading organism.

3. That the exciting cause may be one or a combination of the many influences capable of lowering the vitality and the powers of resistance on the part of the individual, as a whole.

Ever since scarlatina has been a recognised entity, various endeavours have been made to obviate, if possible, the advent of nephritis.

Milk diet in some form or other has justly been, and will long remain, a recognised form of treatment.

Priestley and others say that with inunction of eucalyptus oil the complications are fewer, but I have had no opportunity of observing this.

Hydrotherapy.—On the principle of stimulating the circulation, and thus producing a more vigorous flow of blood through the kidneys, and by mechanically removing the surplus skin during desquamation, and also by permitting the sweat glands to act more freely, hydrotherapy is recommended. It is practised, chiefly in Germany, from the very beginning of the disease, and Schill, Thomas, and Leichtenstern[1] state that the nephritis is diminished by it.

Serotherapy.—If the nephritis be due to organisms or their toxins circulating in the blood, and eventually being excreted by the kidneys, serotherapy has a great future. But little has been done as yet. In 1896, Josias, of the Trousseau Hospital, gave an account of the experience of that institution with Marmorek's anti-streptococcal serum. But the results were disappointing. Moser of Vienna prepares a "Scharlach-streptokokkenserum," by first obtaining, as soon after death as possible, the blood from the heart of a patient who has died of scarlatina. This is mixed with bouillon, and is injected into a horse, and when the horse is recovering from the attack, some of its blood is taken, and the serum is separated from it, and used for the treatment of scarlatina patients. I had the opportunity of seeing this treatment carried out in Professor Escherich's Klinik at the St. Anna-Kinderspital, Vienna, in the summer of 1905. It is expensive at present, and is given to the severe cases only. Children of 3 years are usually given 100 c.mm., whilst those of 6 years and upwards get 200 c.mm. It is injected into the loose cellular tissue of the lower part of the abdomen. The quantity is large, and the injection is therefore somewhat painful, but none of the cases that I saw had any trouble afterwards at the seat of injection.

I remember two brothers—Michael V., æt. 3 years, who was not nearly so ill on admission as Stefan V., æt. 6 years. Stefan was injected with 100 c.mm., and made an excellent recovery with no sequela, though his temperature was 105° F., and he was extremely ill. Michael was not so ill, and consequently was not injected, but his fauces, instead of improving, got worse, and he was quite an invalid, with a dirty septic throat, rhinitis and nephritis, when Stefan was convalescent. They were admitted together, and the general treatment was the same.

Three other very severe cases in children of 3, 10, and 12 years, I remember, made excellent recoveries under the serum treatment with no sequelæ. So that, unlike Josias's experience with Marmorek's serum, I think that Moser's serum is beneficial in the treatment of very severe cases, and it certainly did anything but harm to the five cases in which I saw it used. It is claimed by the advocates of this serum that the severity of the attack and the complications, especially nephritis, are greatly diminished by its use. If this serum should live up to expectations formed regarding it, and become generally available, it will be a useful adjunct in the treatment of scarlatina and the prevention of nephritis.

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[1] Nothnagel's "Encyclopædia of Practical Medicine."

Urinary antiseptics.—In addition to the older urinary antiseptics, a veritable host of new ones has made its appearance within recent years. On the assumption that scarlatinal nephritis is the result of the scarlatina organism or its toxins, or of a secondary streptococcal invasion, I tried urotropine, hexamethylenetetramine, and metramine at the very beginning of the disease in the endeavour to prevent the appearance of nephritis. Many variations of the same drugs have arisen, *e.g.*, cystamin, uritone, and aminoform. Helmitol and new urotropine are combinations of urotropine with anhydromethylene citric acid. The new urotropine contains 40 per cent. of urotropine, and if the urine be acid it does not act so well as the old urotropine. Griserine was found by Küster of Berlin to have an antiseptic action in the bladder, but it is very apt to cause painful diarrhœa. Hetraline contains 60 per cent. of hexamethylenetetramine in combination with a phenol derivative. It has yet to be proved that it has the same field of usefulness as urotropine.

Hexamethylenetetramine was first produced in 1860 by Butlerow, by passing dry ammonia gas over powdered dioxymethylene. In 1869 Hoffmann showed that hexamethylenetetramine is also formed when formaldehyde is vaporised in the presence of an excess of ammonia.

Urotropine.—Professor Nicolaier of Göttingen[1] modified the process, and introduced the drug into medical practice in 1894, under the name of urotropine.

Metramine is prepared in a similar fashion, but the makers claim that it is recrystallised once oftener than hexamethylenetetramine.

The antiseptic power of urotropine is established by its hydrolytic decomposition into formaldehyde and an ammonium salt, which takes place in the kidneys, ureters, bladder, and probably also in the blood. It becomes hydrolysed into the two substances from which it was derived, as follows :—

$$C_6H_{12}N_4 + 6\ H_2O = 6\ CH_2O + 4\ NH_3.$$

Soon after its introduction, urotropine was found to be very valuable in checking the decomposition of the urine in ammoniacal cystitis, the effect being due to the liberation of formaldehyde at the body temperature. This begins to be eliminated about fifteen minutes after administration, and can still be found in the urine after the lapse of a day or two. It does not render the urine alkaline, and therefore causes no precipitation of phosphates. The great value of the drug lies in the powerful antiseptic properties of formaldehyde, which latter in a solution of 1 in 10,000 has a bactericidal effect.

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[1] Nicolaier, *Ztschr. f. klin. Med.*, Berlin, Bd. xxxviii.

Administration.—I have experienced no difficulty in giving urotropine, hexamethylenetetramine, and metramine to patients whose ages varied from eighteen months upwards. It is best to dissolve the powder in cold water, and give the solution along with plenty of milk or water. As they have a sweetish taste at first, children take them readily. They have a distinct diuretic effect, but up to 7½ grs. thrice daily they do not cause irritation of the kidneys or bladder.

I must remark here that, out of my 133 cases treated with hexamethylenetetramine, six experienced a slight burning sensation in the bladder and urethra. But in no case was it severe enough to cause the discontinuance of the drug, and when given along with a large amount of fluid the irritation entirely disappeared, and in none of these six cases did nephritis develop. The dose I administered was 5 grs., which was given thrice daily, half an hour after food.

The drugs were started on admission, and continued, without interruption, until the twenty-eighth day in hospital, which was usually the thirty-first day of the disease. The difference in patients' ages supplied sufficient variety of dose, and by consistently maintaining the same dosage the statistical comparisons are of more value. I chose a small dose on the advice of Nicolaier, the introducer of urotropine, who recommends that not more than 22 grs. be given daily.

Heubner, after the prolonged use of urotropine in children in the Charité Spital, Berlin, has seen no injurious effect produced on the alimentary or nervous systems; nor were the heart and kidneys deleteriously influenced. Even when renal disease was present, it was not aggravated.

The great benefit resulting from the use of urotropine in cystitis, pyelitis, and phosphaturia, and its wonderful bactericidal effect in typhoid bacilluria, prompted Widowitz of Graz to employ it as a prophylactic against scarlatinal nephritis.

Over a period of three years Widowitz[1] tried urotropine in 102 unselected cases of scarlatina without a single appearance of nephritis. The drug was always well borne, and no injurious effects were observed. The number of his observations is too small to immediately look upon urotropine as a prophylactic against scarlatinal nephritis, and the absence of nephritis in his cases might be a coincidence; but the fact that the 102 cases were unselected, and that no nephritis occurred after the use of urotropine, is distinctly suggestive of the drug having some power of preventing nephritis.

[1] *Wien. klin. Wchnschr.*, 1903, No. 40.

Buttersack[1] administered urotropine in a series of thirty-five cases of scarlatina without nephritis resulting. In view of the high percentage of scarlatinal nephritis in the Municipal Hospital of Charlottenburg, Patschkowski[2] treated fifty-two cases of scarlatina of a very severe type with urotropine, and only two cases, or 3·8 per cent., developed nephritis; whereas, in the same hospital, during the two years previous to the use of urotropine, thirty-seven out of 177 cases, or 20·9 per cent., were complicated with nephritis. So that the result of the use of urotropine has been a reduction of 17·1 per cent. in the scarlatinal nephritis percentage in that hospital.

Urotropine exercises no influence on the excretion of albumin in chronic nephritis, in which anatomical changes take place which it cannot restore. But when scarlatinal nephritis arises, the supposed bacteria are in full activity: and if this be counteracted by a prophylactic local bactericidal agent, there would be a possibility of preventing the anatomical changes in the kidneys taking place, and the appearance of nephritis. Whatever the cause may be, it must have been at work before the onset of the nephritis: and therefore, if the prophylactic treatment is to be of any value, it must be started at the commencement of the disease. It may be that the kidney, through filtering so much toxic blood, becomes at length exhausted and unable to combat the attacking virus.

It is well known that the rhinorrhœa and otorrhœa which frequently follow scarlatina are a fruitful source of "return cases," and it has been demonstrated without a doubt that the bacilluria of typhoid is a very real source of infection.

Why, then, should the urine of scarlatina be considered innocent of spreading the disease?

The continued use of urotropine would act, as in typhoid bacilluria, by entirely removing suspicion from that source.

In August 1905 I commenced to administer urotropine, and later hexamethylenetetramine and metramine, to unselected cases of scarlatina, and continued uninterruptedly till 5th January 1906, by which time I was enabled to make notes on 300 cases which were admitted to hospital in the early stages of the disease. There are twenty cases which I did not count, being those sent into the hospital late on in the disease, when desquamation was well advanced, and also a very few mild doubtful cases. Therefore I think that, by taking these precautions, I have given the drugs a much fairer test than by starting one patient, say, on the third day of the disease, and another on the eighteenth day, and then attempting to compare them.

In giving the drugs from the very beginning of the disease, and looking upon them as urinary antiseptics, I was stimulated by the axiom that prevention is better than cure, and I hoped to aid the kidney in combating the attacking virus. As no one can possibly predict which case will develop nephritis and which will escape, I gave one or other of the three drugs referred to, in every early case, on admission, except those kept as controls. It mattered not whether the case were one of scarlatina simplex of a mild type or a severe type of anginosa. I had no opportunity to administer them in scarlatina maligna, as the only two cases admitted into hospital whilst I was making my observations died within four hours of admission.

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[1] *Med. Cor. Bl. d. Wurttemb. Ärztl. Ver.*, Stuttgart, 1905, October 14.

[2] *Therap. Monatsh.*, 1904, December.

The urine was collected between 2 A.M. and 6 A.M., a fact which should be borne in mind, as practically eliminating the possibility of postural albuminuria. It was tested between 12 noon and 1 P.M. the same day, and every possible care was taken to prevent contamination. I need not here discuss the tests I employed, but I may remark that I found Heller's test to be the most satisfactory for the detection of albumin. It has been the custom in the City Hospital to consider a case of albuminuria one in which the albumin was present more than two days, and I have adhered to this in my cases and statistics.

Those urines which I considered to be indicative of nephritis contained—(1) Blood along with albumin, or (2) renal casts and albumin, or (3) albumin in patients with uræmic convulsions. Cases of albuminuria alone were not considered to be nephritis, where there were no other clinical signs indicative of renal inflammation.

Urotropine I administered in forty-seven consecutive cases of early scarlatina, irrespective of the case being mild or severe, from 9th August 1905 to 18th September 1905, and it was given for twenty-eight days; for if the nephritis did not occur in that time, there was little likelihood of its occurring later. A dose of 5 grs. thrice daily was given, and proved to be not too much for children, and at the same time determined the efficacy of small doses for adults. In this series no case of nephritis appeared, and only one with albuminuria made its appearance.

One case, not included in this series, as the drug was commenced a month after admission, is very interesting.

CASE.—A boy, æt. 7 years, admitted to hospital 10th July 1905 with a severe attack of scarlatina, and on 25th July he developed œdema of the face and ankles, and passed only 12 oz. of urine, which contained renal casts and albumin. On 29th July he developed sharp uræmic convulsions, requiring to be bled, and to have chloroform administered. On 9th August urotropine in 5-gr. doses t.i.d. was commenced, when hæmaturia had been present for some days. From 11th August to the 15th there were diminishing traces of blood and albumin, and by 16th August the urine was clear, after seven days' treatment with urotropine, and it remained so on the patient's discharge from hospital.

In this case, then, where the kidneys were already acutely inflamed, urotropine seemed to allay the process.

Hexamethylenetetramine was given in exactly the same manner as urotropine, with this exception, that I kept every third case that was admitted as a control, and which was treated without drugs. This procedure was continued from 18th September to 14th December 1905, with the result that, out of 137 cases, fifteen had nephritis and seven had albuminuria. Of the sixty-six control cases, six contracted nephritis and one had albuminuria.

The "no drug" cases.—From 14th December to 27th December I administered no drugs to any of the fresh patients. Those who had not completed their twenty-eight days with hexamethylenetetramine were, of course, continued on it till the allotted time was up, just as some of the urotropine cases overlapped those on hexamethylenetetramine. During this "no drug" period, out of twenty-four consecutive cases, two developed nephritis and one albuminuria.

Metramine was given from 27th December 1905 to 5th January 1906. Twenty-six consecutive cases were treated with it, and out of these, three developed nephritis and one had albuminuria.

TOTAL OF CASES.

Cases on urotropine	47
Cases on hexamethylenetetramine . .	137
Control cases	66
Cases with no drugs	24
Cases on metramine	26
Total . .	300

From the following table it will be seen that urotropine comes out of the ordeal very creditably. It may be urged that from 9th August to 18th September is a time when there is usually very little scarlatinal nephritis. But, as compared with other years, for the same period in 1904, in the City Hospital there were three nephritis and five albuminuria cases; and for the same period in 1903 there were nine nephritis and five albuminuria cases.

Hexamethylenetetramine, with its 10·9 per cent. of nephritis, is distinctly above the nephritis percentage for 1905, which was 5·9 per cent. But this drug was administered from 18th September to 14th December, a period when most of the nephritis cases appear.

The control cases to hexamethylenetetramine, which, of course, were treated with no drugs, and those that I have classified as "no drug" cases, for the convenience of reference, with their 8·8 per cent. of nephritis, give a fair idea of the increase of nephritis in the late autumn, but still they are 2·1 per cent. below that of the hexamethylenetetramine cases.

Metramine, with its three nephritis cases out of a total of twenty-six, has a percentage of 11·5, which is higher than any of the others, but, as a matter of fact, it has only one more nephritis case against it than the comparable twenty-four "no drug" cases from 14th December to 27th December.

So, comparing hexamethylenetetramine with its control cases, and metramine with the "no drug" cases immediately preceding it, we see that there is very little to choose between these two drugs; and although they certainly have not diminished the nephritis percentage, yet they have not raised it to any marked degree. The nephritis with hexamethylenetetramine is 1·1 per cent. above its control cases. The nephritis with metramine is 3·2 per cent. above its comparable cases.

TABLE I.—*Showing the Number and Percentage of Cases with Nephritis and Albuminuria, with each Method of Treatment.*

Drugs, etc.	Date of Administration.	Number of Cases.	Number with Nephritis.	Number with Albuminuria.	Nephritis Percentage.	Albuminuria Percentage.
Urotropine . .	Aug. 9 to Sept. 18	47	0	1	0	2·3
Hexamethylenetetramine	Sept. 18 to Dec. 14	137	15	7	10·9	5·1
Controls . .	Sept. 18 to Dec. 14	66	6	1	9·09	1·5
"No drug" cases.	Dec. 14 to Dec. 27	24	2	1	8·3	4·1
Metramine . .	Dec. 27 to Jan. 5, 1906	26	3	1	11·5	3·8
Controls and "no drug" cases	Sept. 18 to Dec. 27	90	8	2	8·8	2·2

I also made tables out for the length of time taken before the urine was clear of blood and albumin in the cases for 1903, 1904, and 1905. But as so many of them cleared up in about ten days, and, after a lapse of about fourteen days, albuminuria reappeared for a period of seven days or so, I did not consider them of sufficient interest for inclusion *in extenso.* It was usually about twenty-three days before the urine was clear of albumin. Of course, some of the urines cleared up in as short a time as three days, whilst others were not free of albumin, at one time or another, for as long as sixty days.

The hexamethylenetetramine cases did not clear up any quicker, nor did they, on the other hand, last any longer than the cases with no drugs. But the nephritis with hexamethylenetetramine was slighter than that with no drugs.

I should, perhaps, say that none of my 300 cases ended fatally.

Table II.—*Showing the Present Statistics of the Prophylactic Treatment of Scarlatinal Nephritis with Urotropine.*

	Cases.	Nephritic Cases.	Nephritis Percentage.
Widowitz	102	0	0
Patschkowski	52	2	3·8
Buttersack	35	0	0
H. P. Thompson . . .	47	0	0

Conclusions.—1. Scarlatinal nephritis is a distinct part of the disease, and should not be looked upon as an inevitable sequela, which presents itself in a certain percentage of cases; and as such it should be open to treatment.

2. The cause of scarlatina is an organism, but of what particular variety sufficient evidence has not been given to determine it.

3. The only form of treatment that is likely to be of any real value in counteracting the nephritis is the prophylactic, the object being either to kill outright, or to weaken the virus by a substance which is in itself harmless. And as the virus is in the general circulation at the beginning of the disease, it must perforce be present in the kidneys and urinary system.

4. The diet and general medical supervision of the patient should be strict. A milk and farinaceous diet should be insisted upon for the first three weeks, during which time patients should be kept in bed, and they should be kept in the house for the two weeks following, and care should be taken until desquamation is completed. Patients should be encouraged to take plenty of diluents as long as there is no evidence of fluid collecting pathologically in any part of the body.

5. All methods of excretion should be encouraged and helped in every way possible. Thus the fauces should be frequently swabbed gently, and gargled with sodium bicarbonate solution to remove mucus, and this should be followed by a weak antiseptic solution, *e.g.*, chlorine water or listerine. A Higginson's syringe should be used when gargling is not feasible, but care should be taken that it is not done too forcibly, to cause the extremely infectious tonsillary exudate to be driven up the Eustachian tubes, as the child splutters and swallows. Desquamation should be encouraged by frequent sponging and occasional tepid baths, to prevent a clogging of the exits of the sebaceous glands with partially shed epithelium. Constipation should, of course, be avoided, but purging lowers the arterial tension, and should be guarded against; for a low arterial tension is detrimental to diuresis, which should be encouraged. Rather

above than below the normal amount of urine should be the guide. A frequent examination of the urine should be carried out.

6. With regard to the use of a prophylactic drug against the nephritis of scarlatina, the only one that has proved itself to be of any value is urotropine. Hexamethylenetetramine certainly did not succeed in diminishing the nephritis, nor did metramine. If anything, the nephritis was slightly increased by these two latter, if one compares the cases treated by them and the ones treated with no drugs in the same period. It is true that urotropine had the distinct advantage of being used in cases in August and the first eighteen days of September, which is a time that the nephritis percentage is usually low. But the fact that of the forty-seven consecutive cases treated with urotropine not one had nephritis, and only one had albuminuria, is, I consider, encouraging enough to suggest the further use of the drug in scarlatina. Hexamethylenetetramine was substituted for urotropine in my cases, because it was so much cheaper in treating a large number of patients, but I do not consider that it is the exact equivalent of urotropine when considered from the point of view of clinical results. I see no reason to believe that metramine is therapeutically any better or worse than hexamethylenetetramine.

7. And therefore, finally, I would suggest that all cases of scarlatina should be treated from the beginning with 5-gr. doses of urotropine thrice daily for children up to twelve years; and for patients above that age, 7½ grs. thrice daily. In the administration of the drug, the importance of dilution with water must not be overlooked; and I would recommend that this treatment should be continued to the end of the twenty-eighth day of the disease.

THE DIAGNOSIS OF RECTAL CANCER.

By P. Lockhart Mummery, F.R.C.S., *Hon. Surgeon, King Edward VII. Hospital for Officers; Assistant Surgeon, St. Mark's Hospital for Fistula and other Diseases of the Rectum, London.*

It may be said by some people that the diagnosis of rectal cancer is an easy matter, and that mistakes can only occur from carelessness in not making an examination. In a sense this is true, as in time most cases of rectal cancer almost diagnose themselves. The great fault, however, in the diagnosis of rectal cancer is that in the vast majority of cases the disease is not detected until it has already made great progress,—such progress, in fact, that in more than two-thirds of the cases successful removal of the growth is quite out of the question when the diagnosis is made. This should not be so, as, unlike cancer of the stomach and most other portions of the alimentary canal, rectal cancer is now capable of direct proof even in its earliest stages. It is of the utmost importance that the diagnosis should be made at an early stage of the disease, as it is then, and then only, in the majority of cases that a successful result can be obtained by surgical operation. Two things are necessary to enable an early diagnosis to be made. First, the condition must be suspected before unquestionable symptoms have arisen; and, secondly, a thorough examination of the whole rectum, and, if necessary, of the sigmoid flexure must be instituted at once in all cases.

The symptoms which may reasonably give rise to a suspicion of rectal cancer may be briefly enumerated as follows.

An undue looseness of the bowels or definite diarrhœa is one of the commonest early symptoms. This condition may be intermittent at first, and may easily be attributed to dietary indiscretions. Often the patient only complains that he has occasional attacks of diarrhœa, and on questioning him it is found that this has occurred during the last month or two; there is also frequently an antecedent history of constipation. Every case of diarrhœa persisting for more than a fortnight calls for a local examination of the rectum. Mucus in the stools may be noticed in some cases, and there may be all the symptoms of mucous colitis. The onset of mucous colitis in an elderly person should be looked upon with the gravest suspicion, and should always lead to a careful local examination. Flatulence and the frequent passing of wind in a person previously normal in this respect is a suspicious symptom. Bleeding is by no means a constant symptom of rectal cancer; it only occurs from ulceration of the growth, and this may not occur at all, or may be very late, in cases where the growth is high up in the more movable portion of the bowel; it occurs

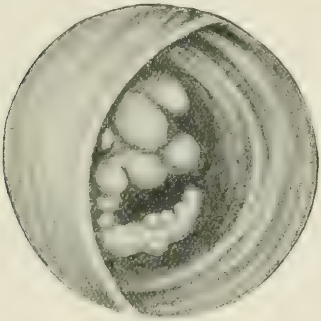

Fig. 1.—Cancer high up in the rectum and out of reach of a digital examination. As seen through the electric sigmoidoscope.

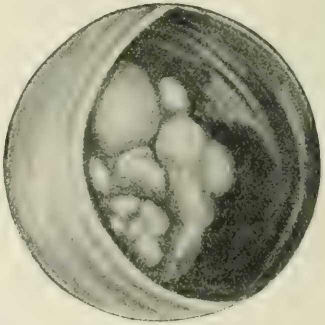

Fig. 2.—A growth high up in the rectum, as seen through the sigmoidoscope. It could not be felt by digital examination. This growth was successfully excised.

earliest in those cases where the growth is situated near the anal orifice.

A dull pain in the lumbar region and a feeling of weight in the perineum after standing or walking are not uncommon early symptoms. Most of the early symptoms of rectal cancer are those of rectal irritation; thus tenesmus and frequent and urgent calls to go to stool are common.

The rapid development of internal piles in a patient previously free from this complaint is suspicious, and apt to be very misleading. I have often seen cases of this sort where severe piles have developed rapidly in an elderly person, and a careful examination has revealed a growth in the rectum. I even know of several cases where an operation for piles has been done though a growth existed in the bowel some 4 or 5 in. higher up. It is necessary to remember that piles in an elderly person are a common symptom of rectal cancer, and it is imperative that on discovering that the patient has piles, an examination of the rectum should be made, instead of, as too often happens, the doctor being satisfied by the discovery of the piles and not carrying his examination any further.

No importance whatever can be attached to the shape of the fæces in rectal disease, and it is a great pity that text-books continue to copy the misleading statement that "pipe stem" or grooved fæces are a symptom of rectal cancer. Slight morning diarrhœa associated with the passage of mucus is a most suspicious symptom, and urgently calls for rectal examination.

It is in many ways unfortunate that rectal cancer in its early stages produces so few symptoms, and it cannot be too strongly insisted upon that a most careful rectal examination should be made in all cases where there is any symptom which is the least suspicious of this condition. It is far better to make fifty unnecessary examinations than to miss one case of early cancer, and so lose the only chance there is of saving the patient's life.

A digital examination will in the majority of cases, if properly carried out, enable us to detect a growth in the rectum, but it is not always sufficient just to pass a finger into the rectum. The patient should be instructed to strain down on to the examiner's finger, and a still better plan is to examine the rectum while the patient is in a squatting attitude: if he then be instructed to strain down, some 2 or 3 in. more of the rectum can be felt. It is hardly possible to mistake the feel of a malignant growth in the rectum for anything else. The growth may be in the form of a stricture or a cauliflower-like mass projecting into the bowel lumen. As a rule, the growth is hard, but a rectal adenoma which is just commencing to become malignant may be quite soft.

Instrumental examination of the rectum.—A digital examination at best only enables us to examine the last few inches of the bowel, and in many cases, if not substituted by instrumental examination, will fail to detect a growth even though one be present.

Fortunately, it is now possible to examine with the electric sigmoidoscope every part of the rectum and the greater part of the sigmoid flexure. A growth, if present, may in this way be with certainty discovered or with equal certainty excluded. No anæsthetic is necessary for this examination, and if properly carried out it causes the patient no more discomfort than a digital examination. A positive diagnosis is of such value in these cases that I do not think any suspicious case should be assumed innocent until the bowel has been examined with the electric sigmoidoscope. In suspicious cases where a rectal examination has been carried out with negative results, a thorough examination of the abdomen under full anæsthesia is advisable, but the necessity for this is much less if the sigmoidoscope is used. A careful abdominal examination is in all cases advisable to ascertain whether there are any enlarged glands in the iliac fossa and along the aorta, and as far as possible to exclude the presence of secondary deposits in the liver.

Our examination does not, however, terminate with the detection of a growth in the rectum, but it is further necessary to decide upon the feasibility or otherwise of removing it. It used to be taught that only those growths the upper limits of which could be reached by the finger, and which were freely movable, were suitable for excision. That statement is now entirely untrue of rectal cancer. It may now be said that all growths of the rectum, whatever their upper limits may be, can be excised successfully, provided that they have not advanced too far. It is now possible to remove a growth the lower limit of which cannot be felt at all per anum, and yet to restore the bowel so that perfect control is left over the evacuations.

So great have been the improvements in the technique of rectal excision, that there is now no portion of the rectum of which it can be said that a growth in that situation is not removable by operation, providing other circumstances are favourable. With regard to the question of the mobility of the growth, it is now generally agreed by those surgeons who have paid special attention to this operation, that partial fixation of the growth is not necessarily any bar to successful excision. Thus it is now the practice at Kocher's clinic to consider neither the situation, the involvement of glands, or the presence of adhesions as necessarily contra-indicating excision. Henri Hartmann of Paris and Tuttle of New York also hold similar views.

Fixation of the growth to the uterus or bladder are, as a rule, decided contra-indications to excision. Partial fixation to the sacrum is, however, no bar to excision, as it is only due to adhesions between the pelvic fascia and the growth; the bone is practically never involved, separation of the growth is easy, and the entire growth and fascia, together with any glands in the hollow of the sacrum, can be removed together.

Fixation to the prostate means that there is great danger of opening the urethra during removal of the growth; but providing the growth can be entirely removed, this does not contra-indicate excision. In one case I removed the posterior portion of the prostrate together with a malignant growth of the rectum, and the urethral wound closed quite readily in the course of about ten days, and the patient has remained free from recurrence for two years. Fixation to the posterior vaginal wall is of little consequence, as no serious disability results from its removal. Enlargement of the glands in the hollow of the sacrum is not a contra-indication, as the whole of these glands can be removed together with the growth, and should be so removed in all cases, whether enlarged or not.

As regards the future condition of the patient after excision, it may be said that in those cases where the sphincters are not involved, it is usually possible to restore the bowel after excision so that the patient has perfect control in the natural way. When the sphincters are involved in the growth, it is not possible to restore the bowel function, and the patient is much better off if the perineal opening is entirely closed, and the bowel allowed to act through a colostomy opening.

Surgery is now able to deal with rectal cancer satisfactorily, if the cases can be diagnosed at an early stage of the disease. The unsatisfactory results obtained in the past are in the main due not to any special malignancy of rectal growths, not to the art of surgery or those who practise it, but in the first place to the fact that patients affected with this disease do not seek medical advice soon enough, and more especially to the fact that those who first see the cases are not careful enough to make a local examination in all cases where bowel symptoms are complained of.

It cannot be too strongly urged that the treatment of rectal cancer can never really be satisfactory until doctors make it a rule to make a rectal examination at once in all cases where patients complain of bowel symptoms.

DEGENERACY.

By P. C. Smith, *formerly Medical Superintendent, Middleton Hall, Middleton, St. George.*

In a recent lecture on Mendelian heredity,[1] Mr. Bateson stated that the transmission of nervous diseases does not follow the laws of heredity, as the ratio of affected to unaffected descendants is nearly always too high. This fact will not appear surprising if we consider that, in the majority of cases, these diseases are either complications or simple developments of a pre-existing condition, so that the scheme of their distribution is modified by the scheme of distribution of that condition. The condition referred to is what has been called degeneracy; a state characterised by imperfections, both of structure and of function, that, as we shall find reason to believe, are of developmental origin. To the best of my knowledge, degeneracy has not hitherto been treated in a similar way to other pathological conditions, with an account of its etiology, pathology, symptoms, complications, diagnosis, prophylaxis, and treatment. This essay is an attempt to fill that lacuna, and, further, to investigate, so far as is possible at present, the mode in which degeneracy is transmitted or distributed. As the more essential features of the morbid histology and chemistry are still unknown, the pathology and etiology are largely a matter of inference from the symptoms, and the discussion of them will be deferred till after these have been enumerated. The most marked forms of degeneracy—idiocy and imbecility—have been thoroughly dealt with in text-books and other works, so we shall not treat of them here at length, but shall merely refer to them in order to complete the picture.

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[1] Reported in *Brit. Med. Journ.*, London, 1906, vol. ii. p. 61.

SYMPTOMS.—These consist of defects, structural or functional, which either are present at birth or show themselves during the period of development.

Structural.—Undergrowth or overgrowth or imperfect formation of one or more systems is common, and may be either local or general. Thus there is often hypoplasia of the muscles, usually affecting all, but sometimes only the calves or great pectorals or some other pair of muscles. Even when the muscles are of normal volume, they are frequently deficient in tone. This want of development or tone, coupled sometimes with laxity of ligaments, may produce spinal curvature, genu valgum, flat-foot, or hernia. Atony of the elevator muscles of the thorax will cause the upper ribs and the cervical fascia to sink, so that the attachment of the pericardium to the cervical fascia is brought nearer to its diaphragmatic attachment, and thus the pericardium, which is normally taut, becomes lax, and allows greater play of movement to the heart. Thus we have the condition of mobile heart. Connective tissue usually errs in the direction of overgrowth; this, combined with feebleness in the abdominal muscles, may lead to enteroptosis. If the liver be prolapsed, the diaphragm and heart will follow it, the latter descending into a wider part of the body where it has more room for movement; thus hyperplasia of connective tissue may be a cause of mobile heart.[1] Imperfect development of blood vessels is shown in varicocele and varicose veins generally; these, however, are partly dependent on laxity of the supporting structures,—varicocele, for example, being accompanied by laxity of the spermatic cord and scrotum, due to want of tone in the cremaster and dartos. According to Dr. Mott, an inherent germinal deficiency may play a part in degeneration of the aorta and other large vessels.[1] Smallness of the aorta and other vessels has also been described. The skin sometimes shows undue thickness or thinness or coarseness, or liability to disease; and the hair and nails often exhibit signs of malnutrition, apart from any illness, so that they probably have some congenital defect. The cartilages and bones may be overgrown or undergrown or imperfect in some way which renders them more liable to the skeletal manifestations of rickets. Hyperplasia of lymphoid tissue is shown by the enlarged tonsils and post-nasal adenoids that occur so commonly in degenerates, and by enlargements of lymph glands also. Ligaments are often unduly lax.

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[1] These two cases of mobile heart were pointed out to me by Dr. C. Addison, Professor of Anatomy in the Charing Cross Hospital Medical School.

These faults of development are sometimes combined to form well-known types. The "tuberculous" and the "scrofulous" types of conformation appear to be due to mal-developments occurring in degenerates; the former depending on hypoplasia of bones, muscles, and fat, with vaso-motor instability: the latter on hyperplasia of skin, connective tissue, and lymphoid tissue, with want of tone in the muscles.

There are also very many errors of development showing themselves on the surface of the body, some of them being due to imperfect closure of fœtal clefts. The number of these is very great: the following is a fairly full list of those that may be present in mild cases of degeneracy.

Disproportion of size between different parts of the body, especially between the cranium and the face, and between different parts of the face. A common example of this is smallness of the lower jaw, which has ceased growing before the rest of the face, or has grown more slowly.

Irregular shape of the skull (due to premature or delayed ossification of the sutures). Flattening of the hinder part of the skull. Markedly lateral position, or doubling, of the whorl of the hair. Asymmetry of the face.

Malformations of the ears: abnormal projection from the side of the head: abnormal projection, or bifurcation, of the root of the helix: absence of the greater part of the helix: notching of the helix: the presence of a certain projection (Woolner's tip) near the upper part of the helix—this, however, was surmised by Darwin to represent the pointed apex of the ear found in other mammals: various abnormalities of the antihelix, tragus, and antitragus: absence of the lobe (this is normal in some races): adherence of the lobe to the cheek.

Malformations of the eyelids: congenital entropion, epicanthus. Malformations of the eyes and their adjuncts: too slanting a position: increased, diminished, or unequal size; coloboma: irregular shape or eccentric position of the pupils: different colour of the two irides; squint.

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[1] *Journ. Ment. Sc.*, London. 1906, p. 685.

Malformations of the nose, as over-development, under-development, lateral deviations of the septum.

Malformations of the lips and mouth: mouth too large or too small; lips too short, leaving the teeth uncovered, or too long, or too thick; hare-lip; palate asymmetric, or too narrow and highly vaulted; defective development of the hard palate antero-posteriorly; non-appearance of some teeth; irregularity of the rows of teeth; increased or diminished size of the tongue; bifid uvula.

Persistent branchial clefts.

Markedly lateral position, or doubling, or even tripling, of the dimple over the sacro-coccygeal joint.

Bifidity of the spinous process of a vertebra (usually lumbar), or of more than one.

Abnormalities of the thorax, such as narrowness; also shortness of the first ribs; funnel or gutter-shaped depressions of the sternum.

Congenital hernia (and often acquired hernia indirectly—from imperfect muscular development).

Undue shortness or length of the upper or lower limbs. Disproportionate length of the forearm or leg as compared with the upper arm or thigh. Exaggeration of the divergence between the axis of the upper arm and that of the forearm—ulna vara, one might call it.

Malformations of the fingers and toes: supernumerary digits; undue shortness, most often of the little finger or the thumb; undue length (rarer—affecting usually the thumb or the great toe); webbed fingers; lateral deviation of some of the phalanges; rotation of some of the phalanges on their long axes.[1] There is another condition that I have often observed in degenerates, but which may possibly occur fairly often in others too—lateral thickening of the proximal end of the second phalanx of one or more fingers. Genu valgum, varum, and recurvatum. Talipes.

Malformations of the genital organs: abnormal largeness or smallness of the penis, torsion of the penis, hypospadias, epispadias, occlusion of the urethra, smallness of the testes, excessive development of the labia majora, supernumerary mammæ, supernumerary mamillæ.

Hair in abnormal positions.

Feminine conformation in men, masculine conformation in women, and infantile conformation in adults.

To these abnormalities of the individual may be added one mentioned by Dr. Féré as affecting the family: great variation in height among brothers and sisters; usually the former tend to dwarfism and the latter to gigantism.

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[1] Lateral deviation and rotation of the phalanges are two of the commonest malformations of degeneracy; yet the latter was not described till last year (Ch. Féré, *Rev. de chir.*, Paris, 1906, January 10; P. C. Smith, *Brit. Med. Journ.*, London, 1906, March 3).

It must be pointed out that a malformation, or even more than one, may be present in an individual though neither he nor his family shows any signs of degeneracy. Moreover, we sometimes even find abnormalities due to incomplete development (such as cleft palate) in several members of a non-degenerate family; I have thought—though as yet I have insufficient evidence—that in this latter case the defect, unlike those of degeneracy, is hereditary in the ordinary sense.

On the other hand, cases have been recorded of marked mental degeneracy without any anatomical stigmata. But these are rare.

Physiological.—Any of the following may occur, some being invariable, or almost so, and others comparatively rare:—

Delay in walking, talking, and development generally; precocious development in some cases; eruption of the teeth premature or retarded (apart from rickets); early senility; the condition which I have described as neurasthenia minor, and Mr. Whiteing—more picturesquely—as being "born tired." I have elsewhere[1] pointed out that the name neurasthenia is commonly given to two complaints that differ clinically—the present condition, and the affection of adults that is characterised by headache, rachialgia, insomnia, intestinal atony, and mental depression, with other symptoms (neurasthenia major). The major disorder in most cases, in this country at least, is simply an exacerbation of the minor. A full description of neurasthenia minor will be given under Psychical Symptoms.

Sensory abnormalities: want of acuity in the various senses, colour-blindness, nyctalopia, hyperæsthesia or hypo-æsthesia.

Defects of the voice, such as speaking through the nose.

Defects of speech, such as stammering, lisping, the mispronunciation of certain letters, the hurried ejaculation of words.

Grimaces, twitching of muscles, and other tics. Nystagmus. Left-handedness. Incontinence of urine. Hiccup.

Vomiting in children without apparent cause or from emotional disturbance. As pointed out by Dr. Still, both this and the previous symptom arise from irregularity of action: hiccup is due to disordered movements of the diaphragm, and apparently causeless vomiting to closure of the pylorus when it should be opened.

Rumination (also due to irregular action).

Inco-ordination, amounting, as a rule, to no more than clumsiness.

Disorderly emotional movements—Dr. Warner's "extra movements"—are readily aroused by excitement. With these perhaps may be grouped nervous inhibitions.

Exaggerated reflexes (in some cases).

Vasomotor abnormalities: ready blushing, attacks of giddiness or faintness, excessive perspiration, pseudo-anæmia, exaggeration of the influence of posture on the pulse rate, tendency to faint, polyuria, frequency of micturition. The pulse tension is usually low.

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[1] *Brit. Med. Journ.*, London, 1903, vol. i. p. 781; and 1906, vol. i. p. 494.

Dilatation of the pupils (sometimes).

Abnormalities of the genital functions: delayed puberty, abnormalities of menstruation, absence of lactation, diminution of sexual power (imperfect erectile power), sexual perversions.

Faulty nutrition. Tendency to epistaxis and other hæmorrhages (apart from hæmophilia).

Attacks of pyrexia in childhood without obvious cause. Night terrors in children. Attacks of palpitation of the heart.

Abdominal distension in children, which may give rise to a diagnosis of tabes mesenterica. Laryngismus stridulus. A paroxysmal cough in children, which resembles whooping-cough and may be taken for it; it often lasts a considerable time, sometimes even months. Cyclical albuminuria.

A craving for stimulants, probably due, as Dr. Harry Campbell thinks, to absence of some normal stimulant from the blood. Alcohol readily affects these subjects, and in a remarkable manner:[1] the usual physiological and psychical symptoms are exaggerated, the behaviour is much more unrestrained and insane than that of tipsy men commonly is, and there is often complete forgetfulness afterwards. We seem here to be on the borderland of epilepsy.

"Essential" epilepsy itself is a symptom of degeneracy.

There is also a liability to develop a craving for morphine, cocaine, tobacco, and other drugs, and often an increased susceptibility to their effects.

Marked susceptibility to climatic influences, and especially to those of relaxing climates. A climate that is bracing for strong and healthy persons may prove relaxing for those under consideration if the invigorating features be extreme. Degenerates cannot support extremes of any kind, even extreme equability, if the phrase may be permitted. The climate must not be very hot or very cold, very equable or with very great differences in temperature between day and night, summer and winter; it must not be very sunny for prolonged periods (I am ignorant of the effects of extreme and prolonged sunlessness); and must not be very damp or very dry, very breezy or very still. The air of the seashore commonly proves unsuitable.

Fatigue, worry, and intoxications of all kinds increase the symptoms, either for short or for long periods. This explains in part the remarkable action of alcohol in these cases, and it is of great importance in connection with the pathology of degeneracy.

Liability to attacks of indigestion, to catarrhs, to infections and to relapses, to rickets, to infantile scurvy, to local syncope (' dead" fingers, etc.), local asphyxia (chilblains), and local gangrene (Raynaud's disease), and to the various neuroses and psychoses. These will be dealt with under the head of Complications.

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[1] Alcohol is the touchstone of the neurotic, say the French.

Some of the insane, and some neurasthenics in a very low state of health, occasionally pass albumin and casts in their urine; this condition clears up after a time, and nothing further occurs to indicate renal disease. Certainly most of these patients, and perhaps all of them, are degenerates, but I am not prepared to say if the condition is dependent on the degeneracy.

To these symptoms must apparently be added the osteogenesis imperfecta described by Drs. Lovett and Nichols at the last meeting of the British Medical Association. The disease appears often to run in families, and the children affected, in addition to the mal-development of the bones, show other structural stigmata that suggest degeneracy.

Psychical.—There are several degrees of degeneracy. They are usually classified according to the mental state, but the more marked forms show a greater degree of bodily degeneracy as well as of mental. Epilepsy may occur in any form. The following list is drawn up in order of severity, beginning with the worst. The classes bracketed together are merely prominent symptoms that are manifested—often two or more together—by degenerates intermediate in degree between the imbecile and the person who is simply neurotic.

1. Idiocy.
2. Imbecility.
3. "Moral insanity."
   Criminality (some forms).
   "Volitional insanity."
   Sexual perversions.
4. "Neurasthenia minor"—neurotism.

Idiocy and imbecility are treated of in text-books, and need not detain us here, except to note that there are perceptible changes — macroscopic or microscopic — in the central nervous system.

In the third group of cases, on the other hand, anatomical changes rarely occur in the central nervous system of a kind that can be observed by our present methods. The cerebral mechanism is obviously disordered, however, and in a way that is essentially the same in the different forms. Some or all of these forms are described in text-books, and we shall confine ourselves here to those fundamental features that are common to them all, and that stamp them as manifestations of degeneracy.

First of these is liability to impulses that are controlled with difficulty or not at all. This want of control must not be mistaken for mere weakness of will, though that also is present. It is due to the overwhelming force of the impulses, which seem to have no connection with the other mental processes of the patient, who recognises their morbid nature, and often resists them strenuously but ineffectually. "Isn't it strange," said a French patient, "that though I know what I am doing, I say things that I don't want to say?" Resistance to the impulses brings with it a feeling of malaise, of oppression at the chest, or even of choking, accompanied by mental distress; this state passes off at once when the impulse is yielded to. The impulses act in many directions, though the phenomenon is essentially the same in each case. There are impulses to restless and aimless movement, and to laugh or cry without reason, sometimes on undesirable occasions. There is the impulse to use gross language, which seems to occur most frequently in women, who fight hard against it. There are also many so-called manias—pyromania, kleptomania, dipsomania, the mania of counting objects (arithmomania), the mania of buying a profusion of objects that are neither needed nor desired, etc. These impulses may show themselves as early as the fifth or sixth year. They have been described as a special neurosis, called impulsive tic, or Gilles de la Tourette's disease, but they are never found alone.

Another prominent symptom is the occurrence of obsessions—the harassing of the mind by undesirable and undesired thoughts that cannot be driven away. These obsessions are accompanied by anxiety and bodily distress. They are indeed of a similar nature to impulses, being presumably due to erethism of nerve centres, and differ from them only in that the latter lead to acts. Among them may be mentioned that caused by some forgotten name or other word, which leads to a prolonged and unquiet racking of the memory; that caused by the sight or thought of certain objects that are supposed to have an evil influence; and what the Germans call *Grübelsucht*, or the worrying over some highly complicated or even unfathomable, and often absurd, problem. An extreme example of this last is the case of the man who worried himself over what would happen if God were the number 13. But the problem need not be meaningless; perfectly rational questions may torment a patient and occupy his mind to such an extent as to render him temporarily useless for the affairs of life.

Akin to these obsessions are the *folie du doute*, and such morbid fears as agoraphobia, claustrophobia, acrophobia (fear of heights), fear of dirt, fear of touching certain things.

A symptom already referred to is weakness of will. These patients are very suggestible, a fact which helps to explain the presence in the same individual of such apparently contradictory features as impulsiveness and fixed ideas. The mind does not pursue the even tenor of its way, thought succeeding to thought in logical sequence, and appropriate action or thought following on sensation, but is liable to be seized and whirled about by impulses and thoughts that almost seem external. This constitutes impulsiveness, but it may happen that an obtrusive thought causes such emotional disturbance that it is constantly present, cannot be eradicated by any process of reasoning, and dominates all thought and action. This is a fixed idea. If the field of consciousness be much narrowed, such an idea may take full possession of the mind even without causing extreme emotional disturbance.

Other symptoms, allied to the impulses, are restlessness, excitability, irritability, and incapacity for sustained exertion. Excitement may rise to such a pitch as to cause momentary forgetfulness, and perhaps even unconsciousness, or, at all events, a state in which the mental powers are in temporary abeyance, and need a decided sensory stimulus to arouse them. Here, again, as in the case of alcoholic excess, we seem to be on the borderland of epilepsy. There is a want of reticence, which is not due to lack of modesty so much as to the impulse to utter whatever is in the mind. There is excessive emotionalism, and the emotions are often morbid in nature. Sexual perversions may occur, and, indeed, masturbation is probably very common in these cases, as well as in those of idiocy and imbecility: perhaps it is not rare in any degree of degeneracy.

Some mental faculty may be deficient, though the remainder are practically normal. Thus there may be marked deficiency of the moral sense, which is not the same as want of self-control, but is the absence of certain qualities that are hereditary in the race: or there may be curious lacunæ in the intellect, such as inability (apart from a neglected education) to spell, to calculate, to appreciate music.

The impulsiveness, the weakness of will, the uncontrolled action of the instincts in certain directions, and sometimes the irregular distribution of the intellectual or moral lacunæ, cause the character to appear singularly unbalanced.

In some instances the mind seems to cease developing at or soon after puberty—a connecting link with imbecility.

The last group comprises the neurotic and neurasthenic, terms practically synonymous. It will be well to trace the life-history of a case of neurasthenia minor from birth to maturity, without confining one's self to the psychical features. The child may be feeble at birth, but it often happens that nothing abnormal is noticed, even anatomically. The first symptom usually observed is a marked febrile reaction to vaccination, and later there is considerable disturbance with teething. The baby may be lively, but he tires easily. Sleep is often irregular, and food may be refused frequently, or very little taken. Sickness after feeding is commoner than in the case of healthy babies. There may be constipation, with or without frequent attacks of diarrhœa: mucous colitis is not rare, and pseudo-membranes may be passed.

Anatomical stigmata are often shown during infancy, though not to the same extent as later. The child is very liable to catarrhs and disorders of digestion, and, when a little older, to the exanthemata, as well as to attacks of "stomach-ache," hiccup, and vomiting; a trifling derangement brings on pyrexia, and there may be febrile attacks, the origin of which cannot be ascertained. When a year or two old, he will very likely sleep with his mouth open, and be found to have large tonsils and naso-pharyngeal adenoids. He may eat soil or wall plaster, or may have other bad habits. In boyhood he will still tire easily. His hand will droop when at rest from want of tone in the extensors of the wrist (Dr. Warner's "feeble hand"). He will be particular about his food, disliking many articles of diet, especially the fat of beef. His sensory acuity, activity, and co-ordination will be below the normal; and, as a result of his deficiency in these three respects, his consciousness will be less vivid than that of normal boys, as well as, possibly, narrower in range. It is not sufficiently recognised that consciousness varies in degree, being quite clear in some, while others perceive all things as through a window, darkly. Moreover, consciousness varies in the same individual under different conditions, fatigue especially having a depressing influence on it. His imperfections in consciousness and power of observation will be exemplified by his slowness in finding a lost toy. He will also be worse at games, and altogether less handy, than his companions. He will be excitable, and "extra movements" will readily be aroused. He may bite his nails. He may be bright and clear, and may have a very good memory, but will be lacking in attention and perseverance, and may be given to dawdling. He will very likely read a great deal, because reading is easier for him than playing, and his deficient vigour needs less outlet. Reading is also easier than thinking; in fact, it is apt to be a manifestation of laziness (and should not be indulged in by anybody except for definite reasons). He will be highly suggestible and easily led. About puberty he will take to day-dreaming, and possibly to masturbation; he may show the "pathological piety" of which Dr. Wendell Holmes wrote. He may be hesitating, and may exhibit a slight degree of the *folie du doute*, returning to a completed thing to make sure that he has really done it. He will very likely be timid, but may be led by emotions or ideals to perform very courageous acts on occasion. He will probably show some peculiarity of temperament, perhaps the commonest being shyness with outbursts of forwardness; he may be reserved or garrulous, ready to take offence or to imagine himself injured, querulous, capricious, obstinate, vain, or revengeful. In some cases there is mental dulness; and it must not be forgotten that this may depend on remedial sensory defects, such as shortsightedness or deafness. In adolescence he may form an exaggerated estimate of his own abilities. His suggestibility and lack of judgment will render him liable to be fascinated by all sorts of new ideas and doctrines, to which he will adhere with an obstinacy that savours somewhat of quixotism and somewhat of self-sufficiency. The listless turning away from effort may lead to loafing, and this may help to create the habit of drinking, to which these subjects are only too liable. In adult life the languor continues, and is most marked in springtime and in the early morning. The "feeble hand" will still be shown. Owing to weakness of will and to the habit of day-dreaming, there is a want of power to concentrate the attention, and to roll away unpleasant thoughts and worries from the mind. This, with the want of vigour, causes an undercurrent of depression, though neurotics are keenly sensitive to pleasure. The intellect is often acute, but soon tires; moreover, it cannot move rapidly from one subject to another, but needs apparently to "limber up"—as if the patient had Thomsen's disease of the intellect! The will is habitually weak, but neurotics are capable of heroic efforts of volition at times. The memory is often remarkably good, so far as retentiveness is concerned, but is apt to be deficient as regards readiness of recall. Judgment is bad, partly from the preponderating influence of the present notion, sensation, or emotion, and partly from inability—through lack of attention—to consider all the aspects of the case. The other psychical symptoms are similar to those in the last group of cases, but much less marked. Neurotics are impulsive, but their impulses are far less forcible, being rarely sufficient to prevail against religious, legal, and social sanctions, except sometimes in the cases of the alcoholic and those with sexual perversions; moreover, resistance to the impulses is not accompanied by distressing physical sensations. Their impulsiveness rarely comes to more than this, and not always to so much: that whatever they want, they must have immediately; whatever thought comes into their heads, they blurt out at once; and new notions, as we have seen, carry them away without allowing deliberation. If they do not curb their impulses, they may develop tics and bad habits, such as Dr. Johnson's custom of touching all the posts in Fleet Street. They are excitable, irritable, restless, and sensitive, and often show great delicacy of feeling; they are suggestible, and apt to be emotional. There may be a lack of reticence. They may be over-scrupulous about the accuracy of their statements or the correctness of their actions to a degree involving the *folie du doute*, and often causing annoyance to others. As a rule, they are not well fitted for the struggle of life; the cloister suits them better than the world.

It will be remarked that in certain respects the mind of the neurotic adult resembles that of the normal child; and this suggests that the condition may be merely one of non-development in certain directions. But in view of the facts that the neurotic adults were abnormal as children, and that there are transitional states between their mental constitution and that of more marked degenerates, whose minds certainly do not resemble those of the young, we may conclude that there is actual mal-development.

It must not be supposed that all neurotics are incapable of action. Many prove themselves able, energetic, and successful men of business. Some have changed the course of history.

Conversely, it is not the case that a subnormal development of one or more of the mental faculties necessarily indicates degeneration. Faulty education accounts for a great number of such cases, and it is also possible that, as with the bodily stigmata, there are congenital defects unconnected with degeneracy.

PATHOLOGY.—The morbid anatomy of the severer forms of degeneracy—idiocy and imbecility—is described in text-books, and need not be referred to here. In the slighter forms, that of the nervous and glandular systems, the changes in which are the most essential, is still unknown. The pathology, however, may to a large extent be inferred from the symptoms.

A most important condition, and one on which some of the others depend, is irritable weakness of the nervous system. On the bodily side, this shows itself by the frequent occurrence of disordered movements; the nerve centres are so readily discharged that impulses flow into unwonted paths. To it are also due the restlessness, the speedy tiring, both muscular and sensory, the inco-ordination, amounting usually to no more than want of handiness, and tics of various kinds. On the mental side it shows itself by excitability, by lack of attention and perseverance, and by impulses and obsessions. There is, in fact, a state of chronic fatigue of all the faculties, including perception, intellect, action, and will. The expression "chronic fatigue" is used advisedly; there is not mere asthenia, but a state in which action is readily excited, but takes an abnormally long time to reach its maximum, and in which effort cannot be sustained at an even pitch, but shows marked oscillations—conditions characteristic of fatigue. There is almost always vasomotor instability.

Metabolism is defective, as is shown by the frequency of disorders of nutrition, by "bilious attacks" (which, no doubt, are a form of nerve storm, but are undoubtedly connected with diet in many instances), by the abnormal odour of some degenerates, and by the frequency of signs of perverted metabolism (excess of urobilin, indican, uric acid, phosphoric acid, or oxalate of lime) in the urine of neurasthenics. There are often, and possibly always, abnormalities of internal secretions. The defective metabolism is probably to be explained by secretory disorders, and so, perhaps, are the faults of development. The likenesses between Graves' disease and neurasthenia suggest an abnormality of the thyroid secretion in many degenerates, and in others there is an elongation of the limbs such as occurs also in those whose testes have been removed in infancy.[1]

A very important pathological condition is diminution of sexual power, which is probably one of the causes of the extinction of degenerate families.

Muscles, bones, ligaments, blood vessels, skin, and connective tissue often show either hyperplasia or hypoplasia: most often hyperplasia in the case of connective tissue, hypoplasia is the case of muscles and blood vessels.

Finally, we must mention the presence of one or more gross anatomical abnormalities.

From the above list of its pathological features, it may reasonably be inferred that degeneracy is a fault of development, affecting many or all of the bodily systems, though the chemical or histological changes in the nervous and glandular systems are still unknown.

Dr. Féré's theory that degeneracy is a dissolution of heredity will be referred to under etiology.

(*To be continued.*)

THE SO-CALLED "PANCREATIC REACTION" IN THE URINE.

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There appeared in the *Edinburgh Medical Journal* for November 1906 an article entitled "A Special Consideration of the So-called Pancreatic Reaction," in which Dr. P. S. Haldane criticised a now obsolete method of performing the "pancreatic" reaction, and adversely commented upon a long-abandoned working hypothesis that formed the original basis of the method. Most of the points raised in that communication have been already dealt with,[2] and such belated criticism would not now call for comment from me, were it not that there may be some who, like Dr. Haldane, are unacquainted with the advances that have been made in this subject since 1904, and would therefore be likely to attach undue weight to the results of his laborious researches and the conclusions he draws from them.

It was not my intention to suggest in my original paper that the presence of glycerin had been proved in the urine in pancreatic disease, nor did I wish it to be thought that the methods of examination I described were tests for that substance. The glycerin theory was merely mentioned to make clear the genesis of the reaction, and was not brought forward as an explanation of the results. In a paper submitted to the Royal Medical and Chirurgical Society in November 1905, and subsequently published in the *British Medical Journal* of 19th May 1906, I emphasised this point, and at the same time described an improved method of investigating the urine which was based upon the results yielded in my hands by the original A and B reactions. Examination of the phenyl-hydrazin precipitate, derived from the urine in cases of well-marked pancreatic inflammation by the A reaction, had shown that it consisted of a phenyl-hydrazin compound of glycuronic acid and the osazone of a sugar, but that the latter was entirely, or almost entirely, absent from preparations made by the B reaction from the same urines. The difference between the two, therefore, probably depended upon the sugar compound. The nature of the sugar was subsequently investigated, and it was found to have the characters of a pentose. No pentose could be detected in the untreated urines, so that it was apparently formed by hydrolysis in the process of heating the urine with dilute acids. An investigation of fifty normal urines, and over one hundred specimens from patients suffering from a variety of diseases not associated with affections of the pancreas, failed to reveal any pentose-yielding body, although most of the pathological specimens and a few of the normal urines were found to contain free glycuronic acid after they had been boiled with a mineral acid.

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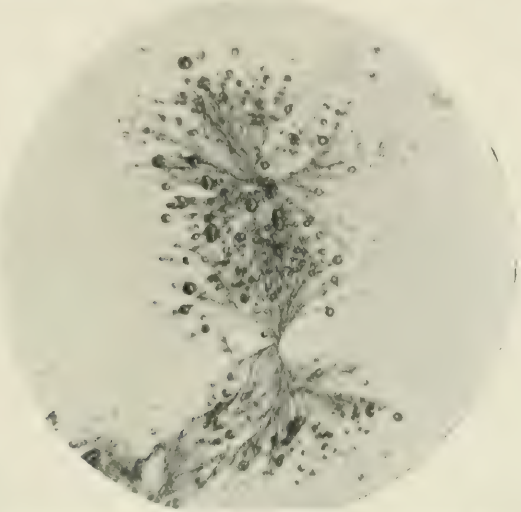
[1] According to Gross and Sencert (*Rev. de chir.*, Paris, 1905, No. 11), this abnormality is due to absence of an internal secretion produced by the epithelial cells in the interstitial tissue of the testes.

[2] *Lancet*, London, 1904, May 5, 18; *Brit. Med. Journ.*, London, 1904, June 18, July 7, 16; *Trans. Royal Med. and Chir. Soc.*, 1905; and *Brit. Med. Journ.*, London, 1906, May 19.

These observations not only rendered the working of the A and B reactions clear, but they also afforded an explanation of the differing appearances and solubilities of the crystals obtained in pancreatitis and in non-inflammatory affections of the pancreas. By taking advantage of the action of tribasic lead acetate upon glycuronic acid and sugars in acid solution, it was found possible to so improve the original A reaction that the need for a comparative test was done away with. The interpretation of the results of the reaction was thus rendered independent of the experience of the observer, and the difficulties that had formerly arisen, in inexperienced hands, from the slight reaction met with in some apparently normal urines, and the more marked deposit met with in many pathological specimens, were obviated. The "improved or C reaction," based upon these considerations and referred to above, is carried out as follows:—

A specimen of the twenty-four hours' urine, or of the mixed evening and morning excretions, is filtered several times through the same filter-paper and examined for albumin, sugar, bile, etc. If it is free from sugar and albumin, and is acid in reaction, 2 c.c. of strong hydrochloric acid (sp. gr., 1·16) are mixed with 40 c.c. of the clear filtrate, and the mixture gently boiled on a sand bath, in a small flask having a long-stemmed funnel in the neck to act as a condenser, for ten minutes. The flask is then well cooled in a stream of water, and the contents made up to 40 c.c. with cold distilled water. The excess of acid is neutralised by slowly adding 8 grms. of lead carbonate. After standing for a few minutes, to allow of the completion of the reaction, the flask is again cooled in running water, and the contents filtered through a well-moistened, close-grained filter-paper until a perfectly clear filtrate is secured. The filtrate is well shaken with 8 grms. of powdered tribasic lead acetate, and the resulting precipitate removed by filtration, an absolutely clear filtrate being obtained by repeating the filtration several times if necessary. Since the large amount of lead now in solution would interfere with the subsequent steps of the experiment, it is removed, either by treatment with a stream of sulphuretted hydrogen, or, what I have found to be equally satisfactory and less disagreeable, by precipitating the lead as a sulphate. For this purpose the clear filtrate is well shaken with 4 grms. of powdered sodium sulphate, the mixture heated to the boiling point, then cooled to as low a temperature as possible in a stream of cold water, and the white precipitate removed by careful filtration. Ten c.c. of the clear translucent filtrate are made up to 17 c.c. with distilled water and added to 2 grms. of sodium acetate, 0·8 grms. of phenyl-hydrazin hydro-



Crystals obtained from the urine by the "improved or C pancreatic reaction" in a case of chronic pancreatitis associated with gallstones in the pancreatic portion of the common bile duct. (× ⅙ in. Oc. 2.)

chlorate, and 1 c.c. of 50 per cent. acetic acid contained in a small flask fitted with a funnel condenser. The mixture is boiled on a sand bath for ten minutes, and then filtered hot through a filter-paper moistened with hot water into a test-tube provided with a 15 c.c. mark. Should the filtrate fail to reach the mark, it is made up to 15 c.c. with hot distilled water; but in my own work I find that this is rarely necessary, as with practice it is possible to so regulate the boiling that the final result nearly always comes out at between 15 and 16 c.c. In well-marked cases of pancreatic inflammation a light yellow flocculent precipitate forms in a few hours, but in less acute and more limited lesions of the gland it may be necessary to leave the preparation overnight before a crystalline deposit appears. Under the microscope, the precipitate is seen to consist of long yellow, flexible hair-like crystals, which when irrigated with 33 per cent. sulphuric acid melt away and disappear in ten to fifteen seconds after the acid first touches them. To exclude traces of sugar, undetected by the preliminary tests, it is always advisable to perform a control experiment by treating a sample of the urine in the manner described above, excepting that it is not boiled with hydrochloric acid.

The urine employed for the experiment must be fresh, and not have undergone fermentative changes. If alkaline, it should be made distinctly acid with hydrochloric acid before the test is commenced. The administration of calcium chloride, as advised by Mr. Mayo Robson, before operation in all cases of pancreatic disease, has been found to interfere with the success of the reaction.

I have employed this method regularly for the past two years, and have examined over 400 urines by means of it, but taking a consecutive series of 200 cases, in which it has been possible to determine the condition of the pancreas post-mortem or at operation, I find that a positive result was obtained in seventy-five, and that no crystalline deposit was detected, either macroscopically or microscopically, in 125. Two of the former were cases of acute pancreatitis with fat necrosis. In sixty-five, I am informed by the various surgeons who operated, and for whom I made the examinations, that the pancreas was larger and harder than normal. A histological examination of the pancreas was made in four of these, and all showed chronic interstitial pancreatitis of the interlobular type. The pancreatitis was found to be associated with obstruction of the common bile duct by biliary calculi, etc., in twenty-one, but in forty-four there was no obvious obstruction at the time of operation. I found a large gallstone in a specimen of the fæces sent to me with the urine, in one, however; and in another I am informed that several had been discovered in the stools shortly before the examination was made. Sixteen cases of cancer of the pancreas are included in this series; four gave a positive reaction, and twelve were negative. A positive reaction was also obtained in four cases of cancer of the stomach or duodenum in which the growth was invading the pancreas. The cases in which no reaction was obtained included examples of cancer of the stomach, colon, rectum, and liver, gastric ulcer, duodenal ulcer, gastritis, colitis, appendicitis, tuberculosis of the intestine, intestinal obstruction, cirrhosis of the liver, hepatic abscess, nephritis, floating kidney, tuberculosis of the kidney, cystitis, mumps, Addison's disease, cholelithiasis, etc. In one case of mumps, where there was tenderness in the pancreatic region, a well-marked reaction was obtained, but as no direct examination of the pancreas was made, the correctness of the diagnosis of metastatic pancreatitis cannot be affirmed, and it is therefore not included in the series.

Although it is not claimed that the results given by this improved method of performing the "pancreatic" reaction are pathognomonic of pancreatic inflammation, the evidence at present available suggests that they may be of considerable service in many doubtful cases. It is true that post-mortem confirmation of the urinary diagnosis has only been obtained in four instances, but the operative and clinical evidence has in so many cases borne out the findings suggested by the examination of the urine, that the recovery of the majority of the patients detracts but little from the practical value of the test as an aid to diagnosis. To quote but one example, which is of interest because of the subsequent history of the case. On 14th December 1905, I was asked by Dr. C. N. Cornish to examine the urine of a lady, who had an abdominal tumour, for evidence of pancreatic disease. I was unable to obtain any reaction however, and suggested that the tumour was probably not connected with the pancreas. The patient was operated on by Mr. Mayo Robson, who found a growth in the first part of the duodenum. A second examination of the urine was made on 18th January 1906, and a well-marked "pancreatic" reaction was obtained, suggesting that the pancreas was now involved in the growth. At the request of the patient's friends the abdomen was again opened, and it was found that the growth had invaded the pancreas and the common bile duct. On 2nd May the urine, which had previously been free from any trace of sugar, contained 5·25 per cent. of dextrose. The amount of sugar gradually increased, the patient became typically diabetic, and died on 5th November 1906. In this case a growth of the duodenum gave rise to no "reaction," but when the pancreas was involved a positive result was obtained. Although the patient subsequently developed diabetes, the "pancreatic reaction" was not due to dextrose, for the precipitate had not the characters of glucosazone, and a control experiment gave no crystalline deposit whatever.

The main difficulty in the use of the improved method arises in connection with cancer of the pancreas. As I have mentioned, twelve out of the sixteen cases (75 per cent.) I have examined gave no reaction, but in four there was a more or less marked deposit of crystals. While a negative reaction, with other signs of serious pancreatic disease, is therefore suggestive of cancer, in about 25 per cent. of cases the results of the "pancreatic" reaction are apt to prove misleading, possibly because of the inflammatory changes induced in the gland by the spread of the growth, unless they are checked by some other method of investigation. The most satisfactory safeguard in my experience is provided by a chemical analysis of the fæces, conducted on the plan I described in the *British Medical Journal* of 25th October 1906. If the results of the examination of the urine and fæces are considered in conjunction with the clinical history and symptoms, the chance of an erroneous diagnosis is very materially reduced, and in the majority of cases a correct conclusion can be arrived at. A chemical examination of the fæces is also advisable in all cases of persistent jaundice and suspected pancreatic disease, not only as a check upon the results of the urinary examination, but because the information obtained by combining the two sets of data allows of a more reliable opinion being formed as to the seriousness of the condition and the probable nature of the cause.

MAJOR ABDOMINAL AND PELVIC OPERATIONS: A RECORD OF WORK FROM THE OLD ROYAL INFIRMARY, NEWCASTLE-ON-TYNE.

By Rutherford Morison, F.R.C.S., *Senior Surgeon, Royal Victoria Infirmary; Lecturer on Surgery, Durham University College of Medicine, Newcastle-on-Tyne.*

Lack of time and the rapid changes which occurred in the staff of the Royal Infirmary of Newcastle have prevented me from carrying out my intention of publishing in the *Edinburgh Medical Journal* a series of papers which I had commenced, and a full record of my surgical work during 1903. As, however, the chief point of this record was to draw attention to the results obtainable by the simplest and antiseptic methods, *i.e.* the use of strong antiseptics for everything but the wound, in the worst possible environment, I have asked my house-surgeon, Dr. Bulkeley, to prepare statistics of the major operations performed by me during his term of office as my house-surgeon in the Royal Infirmary, Newcastle. These have been verified by the Surgical Registrar, Mr. G. Grey Turner.

So far as I can judge, the only serious difficulty arising from this old building was the frequent occurrence of pneumonia after, or even independent of, operation.

The record is that of my last house-surgeon in the old Royal Infirmary, and may in a few years possess some historical interest. For more than one month of his term of office (November 1905 to March 1906) I was not on duty. The statistics therefore refer to a period of less than five months, and do not include the cases of my assistants, who do most of the emergency work.

Appendicitis.

RECURRENT.—Twelve cases.

ACUTE PERITONITIS.—Four cases.

ABSCESS.—Ten cases.

Indications for operation.—In all acute cases, with urgent pain, rigidity, rise in pulse and temperature (and we regard a steady rise in the pulse rate as the most important of these indications), the sooner operation is done the better. In each acute case operated upon the appendix was totally gangrenous. In three of them the peritonitis was localised. These patients were sent in early, and operated upon at once. They recovered.

The following are the notes of one case in which the peritonitis was general:—

F., æt. 16; admitted February 14, 1906.

History.—Illness of four days' duration. Commenced with severe abdominal pain, followed by vomiting.

On admission.—Looked ill, but not dangerously so. Pulse, 136: temperature, 100°. Abdomen tense, distended, and rigid. Signs of free fluid in both flanks. I broke my rule "never to operate radically on a tense distended abdomen."

Operation.—The gangrenous perforated appendix was rapidly excised, and the pelvis gently mopped out. Death occurred next day.

Post-mortem examination showed general peritonitis.

Much previous experience has taught us that such a peritonitis can localise, and that the patient can recover; and we think that this patient's chance would have been better without an immediate operation.

Four cases; three recovered.

APPENDIX ABSCESS.—*Indications for operation.*—Every definite tender lump resulting from an attack of appendicitis is regarded as an abscess, and an indication for operation. The operation performed was that described by me in the *Lancet* of 23rd February 1901. A long oblique incision, extending from the back of the iliocostal space behind to the outer side of the rectus muscle in front, opens the abdomen, allows of complete inspection, packing, posterior drainage, and the removal of the appendix. This has already been located by the relations (shape and position) of the abscess, with the object of removing it, an important aim in every case.[1]

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[1] *Lancet*, London, 1903, February 23.

In nine cases the appendix was removed, and the abscess was drained by gauze and tube.

In one case the cæcum was gangrenous, and the patient so ill that no attempt was made to find the appendix.

Ten cases; ten recovered.

RECURRENT APPENDICITIS.—*Indications.*—To excise the appendix after or at the commencement of a second attack of appendicitis, or if a tender nodule remains after a first attack.

Twelve cases; twelve recovered.

Total, twenty-six cases; one died.

Radical Cure of Hernia.

RADICAL CURE.—INGUINAL—Twenty-nine cases.
„ FEMORAL—Two „
„ UMBILICAL—One case.

Of the inguinal cases, one was strangulated.

Thirty-two cases; thirty-two recovered.[1]

Gall Stones.

CHOLECYSTOTOMY (emptying and immediate closure of the gall bladder) was done in two cases.

Indications.—Repeated attacks of gallstone colic, with patent ducts, and a fairly healthy gall bladder. If the patency of the ducts be not proved by the free escape of bile into the gall bladder after incision, normal saline (as was done in these cases) is syringed into the gall bladder, from which it escapes through the cystic duct, if there is no obstruction. The gall bladder opening is then completely sutured, and the hepatic pouch drained.

Two cases; two recovered.[2]

CHOLECYSTOSTOMY (drainage of the emptied gall bladder).

Indications.—Inflammation, without destruction of gall bladder. One of these cases is of special interest, as it was complicated by subacute pancreatitis.

F., æt. 26; admitted March 10, 1906.

History.—Admitted complaining of "gastric ulcer." Married woman, æt. 26. Two children; youngest, æt. 2. Quite well up to five years ago. She had a severe pain in the epigastrium, which went through to the back, between the shoulders. It made her shout, vomit, and took away her breath. The pain persisted for three to four days, followed by a sore feeling for a further similar period. After the attack was over she got well, and was able to do her work as usual. Since the initial attack similar ones had recurred every six months or so, the last being three days prior to admission. Sometimes the pain came on before, sometimes an hour after, food. Patient said she always fainted either before or after an attack; as a rule, she could eat anything, though she noticed that a big meal of pastry or vegetables brought on an attack; she had always been troubled with "wind."

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[1] See a paper on "Hernia," *Edin. Med. Journ.*, 1904, March and April.

[2] For fuller explanation, see "Gall Stones," *Edin. Med. Journ.*, 1905, October.

On admission.—A well-nourished woman. Temperature, 97·8; pulse, 92. Tongue, dry and furred. Urine acid, sp. gr. 1032. No albumin; no sugar.

Local.—On admission, the only physical sign was rigidity of the upper part of the right rectus muscle.

Later.—In the position of the gall bladder a rounded tender swelling could be felt.

Diagnosis.—Gall stones, with acute cholecystitis.

Operation, March 13, 1906.—Transverse incision. On opening the belly, patches of necrosed fat were seen in the neighbourhood of the head of the pancreas, which formed a large rounded swelling, projecting towards the belly wall. A hole was made through the ascending mesocolon into the inflamed head of the pancreas, which was drained with iodoform gauze. The gall bladder was fairly normal in appearance, but contained several stones, large and small; on their removal, it was drained by a tube. No stone in the common duct.

N.B.—Fat necrosis was seen on omentum, small omentum, over stomach, in mesocolon, and around head of pancreas.

April 4, 1906.—Uninterrupted recovery. Her wound healed before going home.

Three cases; two recovered; one died.

The patient who died was a woman, æt. 31, admitted on 20th November 1905.

History.—Typical attack of gallstone colic (some jaundice) fourteen days prior to admission. Pain eased after first three or four days.

On admision.—Poor general condition. Large rounded tender mass in gall bladder area. Whole belly very tender.

Operation, November 21, 1905.—The gall bladder was found to be distended with purulent contents and a large number of gall stones, and it was drained. During operation it was noted that there were signs of old tuberculous disease in the abdomen.

After progress was entirely satisfactory till 4th December (fifteen days after operation), when difficulty in taking drink, from stiffness of the jaw, was complained of. Tetanus developed, and on 10th December (six days later) she died.

Post-mortem examination.—The surgical conditions were satisfactory. The gall bladder had so far recovered that the normal tessellated appearance of its mucous membrane was distinctly seen. There were old caseating glands from the iliac arteries to the diaphragm, and remnants of old peritoneal adhesions.

This is one of four other cases of tetanus following operation recently in this district, and, so far as I know, they are the only examples of what used to be no infrequent occurrence. On 21st November 1905 I operated on the following cases, in the order given, and two of these patients developed tetanus; one recovered, and one died:—

1. EXCISION OF WHOLE OF INTERNAL SAPHENOUS VEIN FOR VARIX. —Recovery.

2. EXCISION OF UTERUS, TUBES, OVARIES, AND BROAD LIGAMENTS.—Septic. Recovery.

3. MAMMARY TUMOUR.—Recovery.

4. RECURRENT APPENDICITIS.—Recovery.

5. GALL STONES, SUPPURATING GALL BLADDER.—Death from *tetanus.*

6. APPENDICITIS, RECURRENT.—Recovery.

7. ACUTE APPENDIX ABSCESS.—Drainage of abscess, excision of appendix. *Tetanus* developed ten hours later than in Case 5. Recovery.

In these cases we have good reasons for believing, as I hope to show in a later paper, that the tetanus resulted from infected catgut.

CHOLECYSTECTOMY (removal of the gall bladder) was done in two cases. One recovered; one died.

F., æt. 54; admitted March 5, 1906.

History.—She has for years had attacks of windy spasms. About ten weeks before admission had sudden acute pain in the area of the gall bladder, which made her vomit for seven or eight hours. The pain was above the umbilicus, and reached up to the shoulder. She went to bed, her doctor gave her some medicine, and the pain got gradually better. A week later, and again a fortnight later, patient had similar attacks, though not so severe. Since this time they have recurred with increasingly shorter intervals, attended by vomiting for five or six hours. The vomit lately had a foul smell. She has had rigors. Patient had severe cramp in the legs during the first attack. She has been jaundiced, and has lost flesh considerably.

On admission.—She looks pale and anxious. Temperature normal; pulse, 92; tongue very dry; constipation.

Local.—No mass is felt. Tenderness is present in the gall bladder area.

Operation, May 7, 1906.—The gall bladder is in a state of hour-glass constriction. A small ulcer at the contraction ring ruptured when the bladder was raised. The gall bladder was excised. There were several small stones, and many plate-like large masses of cholesterin. One stone was impacted in the cystic duct; another lay in the fundus of the gall bladder. In the cavity of the gall bladder there were bile, mucus, and the débris of gall stones. Death from pneumonia. No necropsy.

CHOLEDOCHOTOMY (removal of stones from the common and hepatic ducts).

Three cases; three recovered.

Twelve years ago I published a paper.[1] The object of this paper was to draw attention to a potential space between the liver above and the transverse colon below, and to show that the gall bladder and bile ducts could be fully exposed and thoroughly drained through a transverse incision over this space. It has surprised me much, and the more as time passes, that surgeons have not recognised the advantage of this route over the usual incision through the right rectus muscle. If the diagnosis of gall stones is definite, I like no other.

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[1] "The Anatomy of the Right Hypochondrium, relating especially to Operations for Gall Stones," *Brit. Med. Journ.*, London, 1894, November 3.

Stomach Operations.

GASTRO-ENTEROSTOMY.—The chief indications for this operation are chronic gastric ulcer. In three patients this had produced hour-glass constriction of the stomach. In all, the operations were done by the posterior method with my own decalcified bone bobbin, because this apparatus saves me time and trouble and has given results as good as any published.

Nine cases; nine recovered.

One of the cases of gastro-enterostomy is of more than usual interest.

Male, æt. 48; admitted April 2, 1906.

Twelve months before began to have epigastric pain and an uncomfortable feeling immediately after food. Vomiting gave relief. The vomited matter was unchanged food. These symptoms had continued. He had lost 2 stone weight in twelve months.

On admission, he was an emaciated, very feeble man, with a hard movable lump the size of a Tangerine orange in the pyloric neighbourhood. A definite diagnosis of cancer of the pylorus was made, but it was decided that nothing more should be done than gastro-enterostomy, for his condition was so bad that he would obviously tolerate no more even if he could survive that.

Operation, April 3, 1906.—Posterior gasto-enterostomy with Mr. Morison's button. The operation demonstrated a firm pyloric tumour, which every one present agreed with Mr. Morison to be malignant. There were also enlarged glands along the lesser curvature of the stomach. He made good progress after the operation, and left the infirmary in two weeks. Re-admitted very much improved, May 14, 1906, for pylorectomy. Weight 8 stone 4 lb.

Second operation, May 5, 1906.—On opening the abdomen, it was found that the entire tumour had vanished, and the abdomen was closed.

July 26, 1906.—(Two months after second operation) the patient came and reported, "Can eat anything at any hour." Weight 9 stone 4 lb.

September 1, 1906.—This condition is maintained.

Though similar cases have been reported by several surgeons, they are in my experience, which has not been inconsiderable, very rare, and it is usually safe to say that a definite pyloric tumour in a patient over 40 is due to malignant growth. A still more difficult case for diagnosis occurred to me on one occasion. The pyloric tumour was surrounded by little sago-grain nodules, and though I did not doubt its malignancy, I excised a gland for microscopic examination. The pathologist reported tubercle, and the patient was cured by gastro-enterostomy.

STOMACH CANCER.—Exploratory operation in the belief that the patient was suffering from gall stones. Death.

Male, æt. 37; admitted March 12, 1906, complaining of "gall stones."

History.—Quite fit up to two years previously. Had an acute attack of pain starting in right hypochondrium and running round the abdomen. It was so severe as to make him shout, vomit, and double up. He has never been jaundiced.

For first four months had on an average one attack weekly, then for three months he had daily attacks, and was also in bed for five weeks. After this he was better, and put on weight. Six months before admission the attacks started again, four months before they became very frequent, sometimes seven or eight in one day, and had persisted up to admission. Four months ago he passed two or three gall stones (about the size of the tip of the small finger). Three months ago he passed twenty-eight stones. One month ago he passed seventeen. The passage of stones did *not* ease his pain. For the past few months he has had dyspepsia. He stated that he had felt a hard lump in the right hypochondrium. His motions have been clay-coloured lately. Perfect health previously. Before the illness he took three or four glasses of beer daily; no whisky. Father, two brothers, and one sister died of "consumption."

On admission, very thin; 8 stone 6 lb. Pulse, temperature, urine all normal. Urea, 17 grs. per 1 oz.

Local.—Tenderness and rigidity over gall bladder area. No mass palpable. Liver not palpable. No stones seen by X-ray.

Operation.—Incision over the gall bladder. This and the ducts were normal. A mass and probable stricture of pylorus were felt. The first incision stitched up and second made from the ensiform cartilage to the umbilicus. The stomach was small, indurated like "malignant pancake," and fixed posteriorly. There were numerous nodules in the mesentery and in the lesser sac. Belly closed up.

Microscopical examination of a piece of omentum showed "distinct infiltration with epithelial cells."

March 28, 1906.—Patient has never been well since operation; has had incessant vomiting and uncontrollable diarrhœa. Death, sixteen days after operation.

Necropsy.—Peritoneum throughout thick and waxy, especially in pelvis. Mesentery studded with small nodules of growth. Adhesions of small gut all over; no obstruction. Stomach small, hard, and infiltrated, especially so about the middle of the body, where an old ulcer was found at the upper part of the posterior surface; the omentum was adherent to this part on its outer surface. No pyloric stenosis. Glands on the aorta were involved. The gall bladder and ducts were normal.

Microscopic report of stomach.—"Colloid cancer."

GASTROSTOMY. — *Indication.* — Stricture of the œsophagus advanced far enough to prevent sufficient milk and eggs being swallowed to maintain the body weight. If the patient is not hungry and dying of starvation, no satisfactory result will follow the operation. In each case the stricture was malignant.

Kader Senn's operation (by which an inverted cone-shaped opening is made in the stomach) was done in each instance. Three cases; three recovered.[1]

On Ovaries and Uterus.

OVARIOTOMY.—In every case the indication was a large cystic abdominal tumour. In two cases the tumour was strangulated from twisted pedicle. In one a four months' pregnancy complicated the condition. This patient, as rarely happens, aborted after the operation.

One case is of interest from the youth of the patient and the many suggestions offered as to diagnosis and the microscopic report.

F., æt. 13, schoolgirl; admitted April 28, 1906.

History.—Patient had noticed an abdominal swelling since January 1906. It began on left side, and had gradually grown. No pain. Patient had never menstruated.

On admission, healthy looking girl. Abdomen distended to size of a full-time pregnancy by a nodulated fluid swelling. No abnormal sound heard over tumour. No mammary changes.

Per vaginam.—The vagina easily admitted two fingers. The cervix was high up, conical, and hard. Bimanually under an anæsthetic, uterus felt separate from tumour.

Operation, May 1, 1906.—A large cyst adherent behind to peritoneum of pelvis behind sigmoid flexure, and springing from the right ovary, was evacuated and removed. Left ovary normal.

Pathology.—Large unilocular cyst 9 in. by 7 in. It contained 2 pints of yellow viscid fluid, which coagulated on standing. The cyst wall was very thick and œdematous, and presented numerous nodules of hard material.

Microscopical report.—"Appears to be a fibrifying sarcoma."

May 11, 1906.—Left hospital, healed.

Six cases; six recovered.

Two cases of large malignant DERMOID CYSTS OF THE OVARY were operated upon. The presence of extensive adhesions and secondary deposits on the peritoneum made radical operation useless. After emptying and cleansing the cyst cavity, the opening was closed by purse-string suture and the tumour was returned to the abdomen. Both recovered.

LARGE BROAD LIGAMENT CYST WITH FIBROID UTERUS.—Enucleation of the cyst and supravaginal hysterectomy.

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[1] One of these patients whose stricture was opposite the cricoid cartilage died a fortnight later, a few hours after the removal of the pharyngeal growth, the larynx, and the thyroid gland, which were bound together in an infected malignant growth.

Woman, æt. 44; admitted January 28, 1906.

History.—Married twenty-five years; four children, youngest 13. She was quite well till one year ago, when she had uterine hæmorrhage persistently for three months. She then continued well till two months before admission, when hæmorrhage returned. For three weeks heavy and continuous hæmorrhage has persisted.

On admission, she was blanched from continuous loss of blood. Pulse varied from 110 to 150 and could not be felt at times. Next day she had considerably improved. Her abdomen was distended by a large cystic swelling the size of a full-time pregnancy.

Per vaginam.—A large cystic swelling bulged down into the left fornix; cervix large; hard uterus to right side of the tumour.

Operation.—A large broad ligament cyst was enucleated from the left side. A large hard uterus with the right tube and ovary was removed by supravaginal hysterectomy. Oozing from the bed of the cyst was arrested by gauze packing, one end of which was brought out through an opening in the posterior vaginal wall. The operation appeared to produce no shock or any change in her condition. Died suddenly the same night.

Post-mortem examination showed no hæmorrhage or other cause of death beyond fatty liver and kidneys.

One; died.

ECTOPIC GESTATION.—We now recognise, clinically, two classes of case—(1) The rarest and most fatal, in which serious symptoms suddenly develop without any warning. (2) The classical variety, with a history of missed menstruation, pain, a supposed miscarriage, sudden development of serious symptoms, and a pelvic tumour.

In the first, rupture of the tube has occurred generally close to the uterus, often too early in the pregnancy to allow of a missed period, and the abdomen rapidly fills with blood. In such a case, the only symptoms may be, sudden pain, usually abdominal but indefinitely located (in one of my cases it was referred to the epigastrium, in another to the heart), followed by marked pallor, signs of free fluid in the abdomen, and profound collapse. Immediate operation accompanied by intravenous transfusion is then indicated.

One case was of this variety, three of the more slow and well-recognised type.

Four cases; four recovered.

PREGNANCY IN ONE HORN OF A BICORNATE UTERUS.—The above name is given to what, so far as I know, is a unique case.

Female, æt. 32; admitted November 3, 1905.

History.—Marriage five years ago; miscarriage four years ago. A child was born after prolonged labour two years ago. Menstruation ceased, and she thought herself pregnant at the end of March last (1904). From this time her abdomen increased in size up to August, and her breasts grew larger. In the beginning of August (five months) she "quickened." Just after this she had pain in the back and left leg, which came on suddenly and made her feel sick. She thought labour was coming on, and sent for a doctor. There was no hæmorrhage at that time, but a few days later a "flooding" came on. From this time there had been pain every afternoon and evening, and some hæmorrhage. The abdomen diminished in size after this, and so did the breasts. There was nothing extraordinary in the progress of the pregnancy before August.

From the history a diagnosis of ectopic gestation with death of the fœtus seemed probable. Physical examination gave the signs of an ovarian tumour with a long pedicle.

Operation, November 9, 1905.—On opening the abdomen the tumour was seen to be the colour of a uterine fibroid. It had a long pedicle, and was easily drawn out of the abdomen. Its appearance, position, and relations to the uterus and broad ligament led to the conclusion that it was an ovarian fibroid. What appeared to be a long Fallopian tube led from the lower pole of the tumour to the left corner of the uterus, which appeared of normal size and shape. The pedicle was ligatured with catgut, and the tumour removed by the ordinary method for ovarian tumours. Section of the tumour was a surprise, for it revealed in its interior a mummified fœtus of about five months' gestation. More careful examination showed that the tumour measured from pole to pole 5 in. The breadth at its widest was 3 in., transverse circumference 9½ in., longitudinal circumference 12 in. The wall of the tumour was thick, and had the appearance that might be expected in the wall of a uterus under similar circumstances. The normal ovary and Fallopian tube were separate from but attached by a pedicle to the upper pole of the tumour; and both the Fallopian tube and the ovarian ligament, which formed this pedicle, ended there. The tube which connected the tumour to the uterus was no larger, but thicker, than an ordinary Fallopian tube. Recovery.

PYOSALPINX.—*Indications.*—Definite tubal swellings or the indications (peritonitis and hæmorrhage) of active and urgent mischief are the only trustworthy evidences of the need for operation. The majority and nearly all chronic cases recover with time, rest, and mercury internally. Some patients present such urgent symptoms that they are admitted as abdominal emergencies, and are sent for immediate operation with a diagnosis of ruptured ectopic gestation or leaking gastric ulcer. In one such case of this series, in which I confirmed the mistaken diagnosis, operation showed a large acute leaking pyosalpinx and pelvic peritonitis. The less acute cases resemble other conditions that cause localised pelvic swellings complicated by active pelvic peritonitis, and often so closely as to be indistinguishable by the most careful and skilful diagnostican. Excluding pelvic appendicitis, which should never be forgotten, these are: leaking ectopic gestation, small inflamed ovarian cysts, and pelvic tubercle.

My rules as to the operation to be performed for pyosalpinx are:

1. When both tubes and the uterus are infected (uterus enlarged, firm, and adherent), removal of the uterus and appendages

by supravaginal hysterectomy. If the uterus is not removed in these cases, the hæmorrhage and pain are apt to continue in spite of the fact that tubes and ovaries are gone; and the experience of having had to perform hysterectomy secondarily on several occasions for this cause appears to me good reason for this view. The method of Howard Kelly, by splitting the uterus, cutting transversely, and turning each half with the broad ligament upwards and outwards from below, is an invaluable addition to pelvic surgery.

2. If the uterus is not badly infected, especially in the case of young women, removal of the diseased tubes alone is the operation of election.

Drainage is necessary in cases where pus has leaked into the pelvis, where intestine is damaged, and in septic as apart from gonorrhœal cases. In doubtful cases, or in those where all oozing cannot be arrested, I always pack and drain, on the principle that as little as possible should be left to chance.

Two cases; two recoveries.

OOPHORECTOMY.—*Indications.*—This was done for mammary cancer according to Beatson's suggestions. No one who has watched the effects of this operation in a series of cases can doubt that in some it produces a marvellous change for the better. No cure has occurred in my experience, but in several cases marked arrest of the disease and atrophy of the breast tumours has followed this operation. In one case of this series the operation was performed on a woman still menstruating, for advanced and inoperable cancer.[1] In two cases (exceptionally young women, 26 and 34 years of age) it was performed for cancer ten days after complete removal of the breast by Halsted's method, as a possible preventive of return of the disease, which in such young subjects was to be expected early under ordinary circumstances.

Three cases; three recoveries.

UTERINE FIBROIDS.—In addition to the usual indications for operation,—namely, hæmorrhage, pressure symptoms, and rapid growth,—it is important to remember that persistent pain is a serious symptom, and does not occur in uncomplicated fibroids.

Supravaginal hysterectomy was performed in every case, though in one instance the tumour was a cervical one 6 in. in diameter.

In the cervical fibroid the fundus of the uterus, perched upon the abdominal aspect of the tumour, was divided down its centre well into the tumour. The tumour was then enucleated, and the two halves of the body of the uterus were excised by transverse division of the cervix from the centre outwards. By this method, which I have practised during the last seven years, and have described for insertion in an early number of the *Lancet*, cervical fibroids can be removed with ease and safety. In the great majority of cases I remove both ovaries. Patients with fibroids or other pelvic troubles who have been ill enough to require operation do not make serious complaint of the symptoms described as consequent on removal of the ovaries.

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[1] *December* 12, 1906.—It is nine months since the operation, and the primary growth and enlarged axillary and neck glands are still shrinking. Her general condition is excellent.

Seven cases; seven recoveries.

CANCER OF THE UTERUS.—One case of cancer of the cervix was operated on by vaginal hysterectomy. The broad ligaments were secured in clamp forceps (hæmostatic forceps do as well as any other form, but many are required). A strand of iodoform gauze was left reaching from the pouch of Douglas into the vagina. The forceps were removed in forty-eight hours, the gauze on the fifth day (after the bowels had been moved). Until the gauze was taken out, all urine was passed through a catheter. No further after-treatment was needful. This is my usual routine.

One case; one recovery.

VENTRO-SUSPENSION OF THE UTERUS.—The indications were uterine prolapse, and a fixed, tender, enlarged, and retroflected fundus. In addition for the prolapse cases perineorrhaphy and anterior and posterior colporrhaphy were done at the same time; in the retroflexion case the cavity of the uterus was curetted and drained by iodoform gauze.

Prolapse, two cases; retroflexion, one case: three recoveries.

On Intestines.

INTESTINAL OBSTRUCTION.[1]

ACUTE OBSTRUCTION.

A man, æt. 22, was admitted on 25th March 1906, very ill, with a history of six days' pain and vomiting. His abdomen was greatly distended and tense. Immediate enterostomy with local anæsthesia (eucaine) and Paul's tube.[2]

One case; one recovery.

RECURRING ATTACKS OF ABDOMINAL PAIN DUE TO OBSTRUCTION OR TORSION OF AN INTESTINAL TUMOUR. MECKEL'S (?)

M., æt. 51; admitted February 2, 1906.

History.—Perfectly well up to fourteen days before admission. (1) He awoke at 1 A.M. with a sudden violent pain across the abdomen, making him groan. (2) Shortly after this, vomiting, which lasted for hours, ensued (the character of the vomited matter is not known). His bowels were opened on the night before. Next morning he sent for a doctor, who found a lump in his right iliac region. Next night he had some return of pain, and for several days he was very sore. His bowels were always regular until after this attack, when he had to take several doses of oil. He had a good appetite, and had lost weight during the past few months.

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[1] For my views on this important subject, see *Edin. Med. Journ.*, 1904, July–August.

[2] Three months later the abdomen was opened, and the obstruction was found to have resulted from bands due to old localised tubercle. These were divided, and the fæcal fistula excised. Recovery.

On admission.—He was a fairly healthy looking man, with a rather lax and pendulous abdomen. When first admitted a hard rounded nodular mass was felt in the right iliac fossa; it could be moved about freely, down into the pelvis, over into left iliac fossa, and upwards into epigastrium. No signs of free fluid were present. Nothing definite was made out per rectum. On examination later, when the tumour could not be found in the abdomen, it was discovered per rectum lying in the recto-vesical pouch, and could be fixed between the hands bimanually.

Operation, February 5, 1906.—A median incision was made below umbilicus. The tumour was pulled out of the pelvis, and found to arise from small intestine, but not within 3 ft. of the ileo-cæcal valve. The bowel was clamped above and below, and the growth removed with 2 in. of gut. End to end anastomosis was performed by Murphy's button. No evidence of intestinal obstruction, no fluid in the belly, nor other growths were seen.

Pathology.—A large lobulated, partly solid, partly cystic, tumour, of a dark violet-red colour, with yellow patches on it (like an ovarian cyst with twisted pedicle), was found growing from the small gut (probably jejunum, since there were many valvulæ conniventes), and attached by a pedicle at its free border; large vessels passed from the mesentery round the gut to reach the tumour, as occurs in Meckel's diverticulum. On opening the gut a rounded depression was found opposite the origin of the pedicle, which held the tip of a little finger. The floor of the depression (which was covered with valvulæ conniventes) was very thin, and the growth could be seen shining through. The whole tumour looked as if it had grown subperitoneally. The cyst contained blood. Weight, 11½ oz.; circumference, 10¼ in.

Microscopical report of the main part of tumour.—"Spindle-celled sarcoma, with marked myxomatous degeneration in places."

On resection of the small intestine, there was a dense opaque area like a scar under the peritoneum and involving it, at the origin of the tumour. This made me suggest that the attack of pain was probably due to twisting of the pedicle of the tumour.

Microscopical report on the scar-like patch.—"This is probably an early infiltration." Recovery.

In one case of chronic obstruction a lateral anastomosis was made between the ileum and transverse colon.

M., æt. 15; admitted November 10, 1905.

History.—Admitted complaining of diarrhœa, colicky pain, and rumblings. Two years ago he had an attack of stomach pain, vomiting, and diarrhœa, and during the past year every fourth week similar attacks occurred, which lasted for seven days. For the past six months there had been in addition loud belly rumblings, which could be heard in the next room. Between these attacks he was wonderfully well.

Is a 7-months child; he did not walk until the age of 4; when 4 years old had "glands in the bowels"; has always suffered from belly pain after food, and diarrhœa. For two years between ages of 6 and 8 he had epileptiform fits at intervals of two or three months, but has had none since. Fifteen months ago was in South Shields Infirmary for "consumption of the glands of the bowels" (no operation). One year ago was in Sunderland Eye Infirmary for three weeks suffering from "ulcer" of the left eye. Family history good.

On admission.—Looked healthy, but very thin. Heart sounds, chest, temperature, and pulse all normal.

Local.—His belly was slightly distended and resonant except in right iliac fossa. No pain, tenderness, nor mass was made out. Very markedly exaggerated peristaltic movements, starting in the left side of the lower abdomen, passed across to the right, where they terminated in the region of the cæcum.

Diagnosis.—Stricture of ileo-cæcal valve, probably tuberculous.

Operation.—A 7-in. oblique incision was made over the cæcum. The mesenteric glands were enlarged. The lower 10 in. of ileum were distended and hypertrophied (apparently 2 in. in diameter). The ileocæcal ring was constricted; on the outside of this the peritoneum was roughened, reddened, and covered with large tubercles. The rest of the gut that was seen appeared normal. Glands extended up to the root of the mesentery, those nearest the disease were distinctly caseous. Lateral anastomosis between the ileum (just above diseased portion) and ascending colon by the Morison decalcified button. Recovery.

RECTAL CANCER.—Two cases of cancer of the rectum, of considerable standing, had invaded the surrounding structures, and caused intestinal obstruction. Both had been treated for months as "diarrhœa and piles." The need for examination of the rectum in cases of "diarrhœa complicated by piles or sciatica" cannot be too strongly impressed upon students, and the importance of rectal examination has become even more pressing, since radical operations for cancer have been attended by such a measure of success during late years.

Colostomy was done in both to relieve the obstructive symptoms. I am very chary about accepting any other indication for this operation.

One case also advanced, but not beyond hope of radical cure, was treated by excision of the whole rectum, coccyx, a part of the sacrum, and the formation of a sacral anus.

Three cases; three recoveries.

EXCISION OF MALIGNANT GLANDS SECONDARY TO CANCER OF SIGMOID.—A year previously I had excised the sigmoid flexure and mesocolon for an advanced malignant growth, and the patient returned, in excellent condition, to see if anything could be done to close the artificial anus. On opening the abdomen (March 20, 1905) with this object, I found further involvement of the mesenteric glands, and removed them by so extensive an operation that I was unable to attempt the cure of the artificial anus at the same time. Recovery.[1]

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[1] Died 9th October 1906.

INTRA-ABDOMINAL ABSCESS; INTESTINAL OBSTRUCTION.

Boy, æt. 8; admitted December 12, 1905. For three weeks he had acute abdominal trouble, pain, and vomiting.

On admission, there was a rounded swelling the size of an orange to the right of the umbilicus, under the rectus muscle.

Operation, December 5, 1905.—An incision through rectus muscle discovered a large abscess covered by omentum. This was evacuated and drained. Death, with symptoms of intestinal obstruction, occurred twenty-four hours later.

Post-mortem showed intestinal obstruction to be due to matting together of coils of small intestine. The mesentery of the small intestine was everywhere studded with enlarged tuberculous glands, many of them calcareous. The abscess was apparently due to suppuration, rupture, and localisation by omentum of one of these. There was no disease of the intestines or of the vermiform appendix. Except locally, there was no peritonitis.

N.B.—The boy had "never ailed" before his present illness, and had looked exceptionally healthy. Death.

ILIO-PSOAS ABSCESS.—I have included these cases because my operation brings them into the list of abdominal operations. The principle of the operation is to expose to sight every part of the abscess cavity. For this purpose a long incision is necessary. It extends obliquely from the outer edge of the quadratus lumborum behind to the outer edge of the rectus muscle in front, along the nerve track. The abdominal muscles are divided down to the transversalis fascia, which is then separated from the iliac crest. On drawing this upwards and inwards with the underlying peritoneum and intestines, the hinder part of the abscess is exposed and opened by tearing widely through the ilio-psoas fascia. The cavity of the abscess is thoroughly cleansed with irrigation and curetting, thoroughly dried with gauze mops, and the bone focus in the spine is exposed, if possible, and curetted. (This was possible in these cases because the disease was at the dorso-lumbar junction.) The cavity is packed with iodoform paste.[1] The whole wound is carefully closed by buried sutures of catgut. After-treatment directed to the general condition and rest of the spine are needful. I have done this operation for the last ten years, with no mortality due to the operation, and very satisfactory results.

Two cases; two recoveries.

On Kidneys.

NEPHRECTOMY.—The indication in these cases was the presence of a large and dangerous kidney swelling. It may still be useful, though it has become common knowledge, to emphasise the need for careful examination of the urine from each kidney, and of cystoscopic examination before excising a kidney. The lesson has been painfully impressed upon me, because on two occasions within the last ten years I have removed the only functional kidney for pyonephrosis. In one of these cases the patient was too ill to allow of abdominal exploration, and instead of draining the kidney, as I ought to have done in the circumstances, I excised it. She died six days later from uræmia.

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[1] Iodoform powder made into a stiff paste by mixing with watery solution of hyd. perch. 1 in 1000.

Post-mortem showed that the left (remaining) kidney had been destroyed years before by tubercle.

In the second case the patient's condition allowed of exploration of the opposite kidney. It appeared to be of normal size and shape, but felt softer than natural (and this I remarked to my assistant at the time, though not attaching sufficient importance to it). The destruction of the enlarged and diseased kidney by suppurating hydronephrosis seemed to be so complete that I removed it. The same sequence of events, good recovery from the operation, but complete anuria, as in the first case, followed, and death on the eighth day. The kidney excised had a stricture at the upper end of its ureter. The opposite kidney was entirely destroyed by gummatous deposits, the result of old syphilis, but still retained its normal shape and size, as if it had been stuffed with gummatous matter.

The notes of the present cases are:

Case 1.—Female, æt. 36; admitted January 10, 1906. Twenty-four years before, patient began to have severe attacks of pain in her right side. These attacks lasted for twelve years. Four years before, shortly after a confinement, she was jaundiced for a month. Six months before, aching pain commenced in the right loin. At the same time she vomited about a quarter of an hour after taking food. These symptoms continued for five months. Shortly after the onset of pain a swelling appeared for the first time in the right side. She did not think it was increasing in size. She had noticed her water very thick. She thought she had got thinner.

On admission.—She was a healthy looking woman with a normal temperature. There was a tumour in the right renal region the size of a fœtal head.

Per vaginam.—The right ureter was considerably thickened, and pressure on it caused an urgent desire to micturate. The urine, on standing, showed a thick, purulent sediment; (by segregator),—that from the right kidney was opaque from pus, and contained 1 gr. of urea per oz.; that from the left was perfectly clear, and contained 8 grs. of urea per oz.

Operation, January 16, 1906.—Nephrectomy. The kidney measured $5\frac{1}{4}$ in. by $4\frac{1}{2}$ in., was generally distended by pus, each calyx being separately involved. Very little normal kidney tissue remained. A large uric acid branched calculus filled the pelvis.

Case 2.—Male, æt. 38; admitted December 27, 1906. Eight years before he had a sharp pain in his belly, travelling down to both groins. Seven weeks before he had pains in the back. Six weeks before he felt ill, and had night sweats. Four weeks before he felt a lump in his right side. Three weeks before he had frequency of micturition and pain just before the act, and passed small quantities of foul urine. For years he had noticed a white urinary deposit, but had never seen blood.

On admission.—A thin, ill-looking man. Pulse and temperature normal. Urine alkaline; sp. gr., 1015. Albumin and pus were present. Urea average, 250 grs. per day. No tubercle bacilli were found. Examination of the bladder was attempted on two occasions, but bleeding was so readily produced that the results were negative. The abdomen was distended by a cystic swelling the size of a seven-month pregnancy, occupying the right kidney region.

Operation, January 6, 1906.—The opposite kidney was first felt through an anterior incision. The swelling was incised, and found to contain non-smelling pus in large quantity; after evacuation of its contents, and clamping the opening, the kidney with the thickened upper half of the ureter were removed.

Pathology.—An immense pyonephrotic kidney. No stone was found in thickened ureter. The calyces were dilated and converted into pus cavities. The walls were lined by granulation tissue. A large stone, 1¼ in. by ¾ in., was found in the upper part of the kidney nowhere near the pelvis.

The pathologist's report after microscopic examination is: "Though not certain, has little doubt that it is tuberculous."

Case 3.—Female, æt. 51; admitted February 16, 1906. Six weeks before attacks of pain commenced in the left lumbar region. They came on suddenly, were very severe, and recurred once a week. Hæmaturia followed each attack. Three weeks later she noticed a lump in her side the size of a hen's egg, which had grown gradually larger. Since then there had been no more attacks. She had lost much flesh lately.

On admission.—A small, thin, feeble-looking woman. Temperature, 99°. A large (size of adult head), solid, fixed mass was present in the left kidney region. Urine neutral; sp. gr., 1015. No albumin nor sugar. A mucous deposit present.

On segregation, the urine was as follows:—

From the right side—four times quantity from left. Urea, 7 grs. per oz.

From the left side—defective quantity. Urea, 3 grs. per oz.

Operation, February 24, 1906.—There was a large growth in the lower half of the kidney. It was adherent to the vessels in the descending mesocolon, and there was a large irremovable mass of malignant disease on the inner border of the kidney. As a palliative operation, the kidney, the tumour, and a portion of adherent peritoneum were excised.

Pathology.—On section, the growth looked like a hypernephroma. The ureter was blocked with blood clot.

Microscopical report.—Hypernephroma.

Five months later the patient returned in much improved condition, but with evident abdominal growth.

Three cases; three recoveries.

The operation in the first case was done through the ordinary oblique incision. In the second and third through an incision which I introduced about seventeen years ago. After experiments on the dead body, I found that the best access to a kidney pedicle and the easiest removal of the kidney was secured by a T-shaped incision, the vertical portion passing through the rectus muscle, and the transverse back into the flank. For large kidneys I always use it still, and have discovered no drawback. Hernia is the objection raised, but I think we have learned that it is equally true to say that hernia may be provided against through any abdominal wall incision, while at the same time it is impossible to always prevent hernia.

On Bladder and Prostate.

HOUR-GLASS HYDROCELE.

A male, æt. 18; admitted December 20, 1906.

On admission there was a large scrotal partially reducible swelling on the left side, with a marked expansile impulse on coughing. (A variety of trusses had been tried during the past year, and failed to retain this "rupture," and he was sent in for a radical cure of hernia.) Pressure above Poupart's ligament discovered a large deep cystic swelling which could also be felt bimanually (a finger in the rectum and hand on abdomen).

Operation, December 23, 1905.—An attempt was made to dissect out the entire sac through the inguinal canal. The portion from the scrotum was easily dealt with, but the pelvic portion was so thin and so closely adherent to the peritoneum that several holes were made in this, and it is doubtful if the whole of the upper part was excised, though the greater portion of it was. After closing the peritoneal openings, the inguinal canal was closed by Bassini's methods.

One case; one recovery.

SUPRAPUBIC CYSTOTOMY.—*Indications.*—In one case, that of a child with a *large stone and acute cystitis*, the bladder was opened and drained, and the stone removed. In three cases the operation was peformed for *prostatic obstruction.* I do not like the ordinary operation of suprapubic prostatectomy in spite of the published results. It is done in the dark, removes more than is essential, occasionally requires considerable force, and is only accomplished by tearing all resisting tissues. No operation with these disadvantages can have come to stay. I do not yet know that in detail the operation I perform is a solution of the difficulty, but it is based on two important principles—(1) To see the cause of the obstruction, and (2) to remove it only.

The bladder is widely opened transversely with the patient in the Trendelenburg posture, and by means of retractors, mops, and a good light the internal meatus is fully exposed to view, and the prostatic urethra explored by a finger. Any obstruction is cut away with punch forceps, or adenomata are enucleated, all bleeding is arrested, and the bladder wound is sutured except where the drainage tube emerges.

Four cases; four recoveries.

On Liver.

Epiplorrhaphy.—*Indications.*—Ascites the result of alcoholic cirrhosis.

A male, æt. 49; admitted January 3, 1906.

Since his youth the patient had been a free consumer of beer, and for six months his health had been failing. During three weeks before admission he had been tapped four times, and more than a gallon of fluid was removed on each occasion.

On admission.—His general condition was fair. His kidneys and other organs appeared to be healthy. His abdomen was much distended.

Operation, January 6, 1906.—A median incision was made above umbilicus. (The diagnosis of hepatic cirrhosis was verified by inspection of the liver and palpation of the much enlarged spleen.) A second incision large enough to admit a drainage-tube was made midway between the umbilicus and pubes. The abdominal cavity was mopped dry, the surfaces of the liver and spleen and adjoining peritoneum were roughly scrubbed with a mop, and the omentum was stitched across the parietal peritoneum lining the anterior abdominal wall. The upper wound was entirely closed. Broad bands of strapping were firmly applied over dressings from the costal margin above to the neighbourhood of the tube below.

After progress.—The tube was kept in for ten days, during which it was regularly exhausted by a tube and syringe passed into the recto-vesical pouch. It was then removed. He was discharged with the wounds healed, January 23, 1906 (seventeen days after operation). On 28th February he returned with fluid in the abdomen; tapped—28 pints removed. Since then he had twice been tapped by his own doctor, but when he last came to the hospital in June, three and a half months after the last tapping, he was perfectly well, and there was no fluid in his abdomen.

Summary of Results.

OPERATIONS FOR RADICAL CURE OF *Hernia*—

Inguinal	29	Recoveries, 32.
Femoral	2	
Umbilical	1	
	32	

APPENDICITIS—

Acute	3	Recoveries, 24; death, 1.
Abscess	11	
Recurrent	11	
	25	

GALL STONES—

Cholecystotomy	2	Recoveries, 8 ; deaths, 2.
Cholecystostomy	3	
Cholecystectomy	2	
Choledochotomy	3	
	10	

STOMACH OPERATIONS—

Gastrostomy	3	Recoveries, 12 ; death, 1.
Gastro-enterostomy	9	
Exploratory	1	
	13	

ON OVARIES AND UTERUS—

Cases	30	Recoveries, 29 ; death, 1.

ON BLADDER AND PROSTATE—

Cases	4	Recoveries, 4.

ON INTESTINE—

Lateral anastomosis	1	Recoveries, 7.
Resection	1	
Enterostomy	1	
Excision of rectum	1	
Inguinal colostomy	2	
Excision of secondary glands	1	
	7	

NEPHRECTOMY—

Cases	3	Recoveries, 3.

OTHER OPERATIONS—

Cases	5	Recoveries, 4 ; death, 1.

TOTAL—

Recoveries	123
Deaths	6

REVIEWS OF BRITISH AND FOREIGN LITERATURE.

Text-Book of Human Physiology. By Dr. ROBERT TIGERSTEDT, Professor of Physiology in the University of Helsingfors. Translated from the Third German Edition and Edited by JOHN R. MURLIN, A.M., Ph.D. London: Sidney Appleton.

FOR some of the sections of this book we have nothing but praise. The Physiology of Metabolism, the Circulation, and the Central and Peripheral Nervous Systems is particularly well done. One of the subjects treated of in the most exhaustive manner is that of Nutrition and Metabolism. Due recognition is made of the relative merits of the two rival theories of proteid metabolism. There is a refreshing absence of dogmatism on points on which possible differences of opinion may honestly exist; and, where no conclusion pointing more in the one direction than in the other can be drawn, the reader is candidly told that the matter is still undecided or waiting for further research. There is no holding up of the hands in holy horror at the bare idea of a view on a subject being held at variance from the author's or the editor's. Most of the later contributions to metabolism or absorption—the proteid minimum, Atwater's work, Folin's work—are discussed with the necessary fulness.

There are special sections on the important questions of the energy requirements in growing children, and on nutrition in the young: throughout all the considerations of metabolic problems there is excellent use made of charts for the presentation of statistical data.

The chemistry of the blood, and especially that of the derivatives of hæmoglobin, is less fully gone into than might have been expected. The subject of phagocytosis cannot be considered as completely treated in that there is no mention of opsonin at all.

The treatment of the Physiology of the Central and Peripheral Nervous Systems is characterised by a most commendable breadth of view. A comprehensive and philosophical survey of the functions of the central nervous system regarded as related to each other rather than as isolated neural activities, is amongst the many excellences of this part of the book.

The chapters on the sensory functions of the skin and on the organic sensations, although condensed, contain a good deal of matter not met with in text-books designed for the use of "the second year medical student" in Great Britain, whatever may have been customary in this respect in America. The prominence given to an analysis of fatigue and of sleep is to be especially commended. The functional bearings of the afferent impulses related to orientation are excellently treated, and the same may be said for the sections on the "motor" sensations, although the omission to describe the end-organs of the muscular sense, and allude to the names of Ruffini and Sherrington in this connection, seems curious. Probably this is due to a too rigid adherence to the determination laid down in the preface to the first edition, namely, to omit even the short histological descriptions generally given in text-books of physiology.

The subject of Pain receives separate attention, which in a work designed for future men of medicine is only what was to be expected; but in view of its great clinical importance, a good deal more might have been given on "referred pain," in which connection one fails to find any mention of the work of Head and of Mackenzie either in the text or in the list of references that closes the chapter.

The comparative physiology of the central nervous system is excellent, and the sections on the cerebellum, on Flechsig's methods and results, and the psychical alterations consequent on various extirpations, all display a wealth of well-arranged statement not usually met with in works of this class. Indeed, the manner in which the relations of the psychical to the physical is treated, is an admirable compromise between a too psychological analysis on the one hand, and a too cavalier disregarding of consciousness as a factor of any consequence whatever on the other.

The account of the historical order of discoveries in connection with the central nervous system is the only attempt in the whole volume to present the complete history of any part of the subject—a circumstance no doubt to be explained by a desire to limit the size of the book.

While some of the figures in the chapter on Vision are conspicuously good, the section on the action of the ocular muscles might with advantage have been very much fuller. Any discussion of stereoscopic vision which omits allusion to the stereoscope's companion instrument, the pseudoscope, is unsatisfactory. Again, in connection with peripheral vision, one expects to find some form of perimeter figured or described.

The physiology of the vascular system is, as we might expect from the author of the "Lehrbuch der Physiologie des Kreislaufes," a masterly summary. It is a most interesting, discriminating, and well-arranged account. Although Hill is quoted on intracranial pressure, the absence of his name from the pages on the cerebral circulation strikes one as peculiar. The topics of vascular tonus, cardiac rhythmicality, and the cardiac vagus are very well treated. There is throughout the book a distinct spirit of restraint in respect of matters more interesting to the "pure" physiologist than important to the future physician and surgeon; and this may explain the scanty treatment of such subjects as the genesis of tetanus, the voluntary tetanus, electrotonus and "polar" phenomena, and thermo-electricity. The electrical phenomena of the stimulated retina receive their treatment within the compass of two lines.

There is an excellent chapter on the Internal Secretions; but in the section on the Adrenals the work of Schafer and Oliver is not once alluded to. The account of Digestion is well done from all its various standpoints, Cannon's and Pawlow's work being duly incorporated.

The account of the Respiration is sufficient, that of the innervation of the function particularly good; but the omission of Haldane's name from this section on blood-gases prevents our praising this chapter as highly as some of the others.

The book makes no attempt at an exhaustive presentation of the chemical relationships of the several substances of physiological importance, and no chemical technique is described — but what applies to omitting histology will of course also apply to omitting the *methods* of physiological chemistry. Methods and instruments of "experimental" research are, however, explained and frequently figured in sufficient detail wherever they are necessary.

The authors evidently believe, and we think rightly, that "Physiology" still includes the subject of "Reproduction," to which one of the closing chapters is devoted: much, but not all, recent work in this province is noticed.

The authors wisely open the book with a condensed account of the general vital phenomena of cells, which is followed by a description of the effects of external influences on cells: this includes the various forms of "taxis." In this chapter, although the "oxidative processes" are alluded to, their functional counterpart—the reducing-power of tissues—is not included.

The book may certainly, in the words of Dr. Lusk, who writes the introduction to the American edition, "be earnestly commended to the medical student and to the practitioner."

Enteric Fever in India: A Study in Epidemiology and Military Hygiene. By Major Ernest Roberts, I.M.S. London: Baillière, Tindall, & Cox.

As explained in a private note by the author, "the sub-title of this work expresses and defines its scope and aims more accurately than the main title," the subject being treated from an epidemiological and hygienic aspect, without reference to symptoms or treatment.

The book, which comprises 571 pages of letterpress, with thirty charts, diagrams, and maps, and over eighty tables in the text, is divided into ten chapters. Chapters i. and ii. are devoted to a historical survey of the influences which have affected the character of the personnel of the British Army in India, and the course and rise of enteric fever among these troops during the latter half of the nineteenth century.

Chapters iii. to vi. treat of epidemiology, while in Chapters vii. to ix. the incidence of enteric fever among natives of India and other tropical and sub-tropical countries is considered; and finally, in the last chapter, conclusions and indications are submitted, together with certain points on prophylaxis and suppression.

Major Roberts has fully availed himself of the unique opportunities afforded him as Statistical Officer and Secretary to the Sanitary Commissioner with the Government of India, of studying the records of the last fifty years. The result, which must have been attained by the most arduous labour, is a work which surpasses in size and interest anything which has hitherto been published on this subject. The time of publication is well chosen, as the mass of statistics, carefully arranged for easy reference, should prove of great assistance to the Commission at present investigating enteric fever in India.

The main contention of the essay is in support of the theory that intra-cantonment foci are the pre-eminent factors in the lamentable spread of enteric fever in India, while the extent of the prevalence of the disease among the native population is wisely left an open question, to be settled, possibly, by the present Commission.

The complete abolition of the present system of excretal conservancy in cantonments, and the introduction of a water-carriage system with treatment by "biological" methods, as suggested by the author, is an idea not likely to find favour with the Indian Government, on the score of expense, though, as enteric fever accounts for over 40 per cent. of the total deaths among the British troops, with an estimated annual loss of £230,000 from invaliding, etc., it might reasonably be expected that money should be forthcoming and profitably spent in the institution of measures tending to prevent the spread of the disease. The appointment of the present Commission may be accepted as a sign that both the Home and Indian Governments are becoming conscious of their responsibilities in the matter.

Occasionally the reading of even official Indian reports is lightened by touches of the Babu's pen; for instance, in a recent report of the Sanitary Commissioner with the Government of India, reference is made to "*venereal disease, diarrhœa, and other respiratory diseases.*" There is nothing of the kind in the book under notice, as it has evidently been very carefully revised by the author. On the other hand, the diction is of an ultra blue-book type, as witness the following paragraph selected at random:—"As regards the estimate of the share enteric fever takes in the mass, we must be guided by the same principles as have served to differentiate those other specific affections, and not be content with assumptions based on their probable exclusion in particular cases, as if they represented the full extent of the pathological possibilities." Had the author been able to adopt a less elaborate style, the size of the book would have been diminished without any diminution in value, and it would have afforded much more pleasurable reading.

In the appendix there is a verbatim extract from the report furnished by Greig, who was last year deputed by the Indian Government to visit Germany to study the methods employed there, in which the laboratory technique is very clearly and minutely described.

The $CHCl_3$ Problem. By RICHARD GILL, M.B., F.R.C.S. Edinburgh and London: William Blackwood & Sons.

THE title of this work is an unfortunate one. Those who have devoted attention to the matter are forced to admit that there IS a chloroform problem, but the use of the chemical formula of the drug in the title as above is somewhat unhappy.

The division or lack of division of the subject matter of the book is archaic in the extreme, belonging to the era of the Bridgewater Treatises!

The author has an obvious and commendable desire to make himself perfectly clear and logical, but the straining to do so leads to confusion, involved sentences, and parentheses, which produce a feeling akin to despair in the reader. For instance, an effect MUST be greater OR less, and it is futile to labour the point. An attempt on pp. lxv and lxvi of the preface to demonstrate, by means of algebraic formulæ, the various ways in which chloroform leads to respiratory arrest will, we fear, not be informing to the average reader.

The absence of clearness and suitable division or breaking up of the text are the more regrettable, as the book undoubtedly contains much valuable matter, the result of many years' observation and careful study.

There is much that is admirable in the remarks on the pupil as affected by chloroform, and the action of chloroform on the circulation. Every one will not agree with the statement that "primary cardiac syncope is associated with some inherent abnormality of the heart." We think few pathologists will confirm this statement.

The stress which the author lays on the importance of imperfect aeration of the blood as influencing the course of anæsthesia is important, and draws attention to an often neglected and overlooked cause of death or difficulty under chloroform. We believe, indeed, that the keynote to the chloroform problem is indeed largely "undetected asphyxia."

We would express the hope that in future editions the author would somewhat condense the work, and for the sake of clearness divide it up more freely, supplying either marginal notes or headlines, so that the reader may grasp the leading points of this knotty problem.

Catalogue of the Pathological Museum of the University of Manchester. By Professor LORRAIN SMITH. Manchester: Sherratt & Hughes.

THE collection of specimens which is here catalogued came originally from the Manchester School of Medicine, and about thirty years ago came into the possession of Owens College. The first catalogue was drawn up by Dr. William Smith in 1884, and has since been added to by Professors Dreschfeld, Young, and Delépine. The new catalogue is the work of the present incumbent of the Chair of Pathology—Dr. Lorrain Smith—with the assistance of Drs. Anderton, Walker Hall, Hill Griffith, and others.

In the arrangement of the catalogue, the decimal system of classification introduced by Dr. Abbott, of the M'Gill University, has been adopted.

The catalogue compares very favourably with others of a similar character, and, apart from its value for teaching purposes in an important medical school such as that of the University of Manchester, it is capable of being of great assistance to others as a work of reference. An important feature is the frequency with which there is added a report of the microscopical examination of the individual specimens. This has enabled the authors, for example, to illustrate such types of tumour as the endotheliomata in a manner which has not been attempted in museum catalogues in general use.

If funds were available to furnish photographic reproductions of the specimens for inclusion in the catalogue, it would prove still more valuable as a pathological work of reference.

We beg to congratulate Professor Smith and those who have been associated with him in the production of this interesting volume.

The Röntgen Rays in the Diagnosis of Diseases of the Chest. By Hugh Walsham, M.D., and G. Harrison Orton, M.D. London: H. K. Lewis.

Greatly as surgery has benefited by the introduction of the X-rays, it must be admitted that physicians in general have been somewhat slow in appreciating their value in the diagnosis of intra-thoracic lesions. Possibly this has been due in part to the absence, except in the fugitive pages of current journals, of any handy monograph dealing with the appearances to be looked for, but this excuse has now been removed by the appearance of Drs. Walsham and Orton's small book, which gives a concise and accurate view of our present knowledge. In this country the anterior and posterior examinations are generally allowed to exclude all others, and the authors are at pains to show that, particularly in cases of suspected aneurysm, the left oblique examination should never be omitted. There seems no doubt that by paying attention to the mobility of the diaphragm, to the way in which the apices light up on inspiration, and to the translucency of the lungs, it is sometimes possible to diagnose phthisis by radioscopy before physical signs can be detected. The authors also prove that tuberculous deposits cast shadows before they have reached the stage of calcification or caseation. The vertical lines seen on each side of the heart in normal chests are believed to be due to the pulmonary vessels, not, as Cunningham thought, to puckering of pericardium. The book contains a chapter on methods, and the relative importance of screen examination and the use of plates under different circumstances is discussed. The book is illustrated by skiagrams, and is a useful addition to medical literature.

The Medical Diseases of Infancy and Childhood. By Alfred Cleveland Cotton, M.D. Philadelphia and London: J. B. Lippincott Co.

In some directions this is an excellent handbook, in other parts it sinks to mediocrity. The chapters devoted to infant-feeding are very well done—so well done, indeed, as almost to outweigh the rather numerous defects of the second half of the volume; and if the whole had attained their standard Dr. Cotton's book would have deserved little except praise. It is always of interest to learn the latest American methods of infant-feeding, and it is pleasant to find that there the pendulum is now swinging towards simplicity, and away from the complicated percentage methods. Dr. Cotton quotes, as the essentials for the preparation of a good artificial food, Dr. Cheadle's well-known rules, and adds to them one deduced from Chapin's work—that the food selected must be such as to develop the digestive tract in a normal manner. Home modification is clearly and simply described. No one will contest the immense value of Rotch's pioneer work on percentage feeding with laboratory milk, but it is now realised that the essential difficulty is the chemical one, and that by no methods of dilution is it possible so to modify cow's milk as to make it qualitatively like that of the woman. The explanation offered of the frequent success of Budin's method of feeding with full milk seems to us very plausible. Citrating milk to prevent a dense coagulum forming is apparently gaining favour in America. Throughout the whole of this part of the book great attention is paid to general principles, and if it is read intelligently it cannot fail to be useful. The sections on anatomy and physiology contain, among other good features, a full account of Dr. Southworth's work on the digestion of milk in infancy.

Turning now to the descriptions of the diseases of children, we first come to a chapter on congenital malformations which might have been curtailed without loss. It is unnecessary in a book on medicine to refer to malformations which call only for surgical treatment, while, on the other hand, some of those which specially interest the physician, *e.g.* idiopathic dilatation of the colon, achondroplasia, etc., deserve fuller mention. Osteogenesis imperfecta, osteomalacia, and osteopsathyrosis are described separately, and in a rather confused manner. The first is said to be characterised by intra-uterine fractures, the second to be at times congenital and to lead to fragilitas ossium, while the third is described as a disease of infancy. In fact, any one unacquainted with the diseases would be little the wiser after reading what Dr. Cotton has to say about them. It is now well enough known, however, that osteogenesis imperfecta is the same disease as idiopathic osteopsathyrosis, and that it is easily recognisable clinically. We doubt whether congenital osteomalacia leading to fragilitas ossium exists at all; probably such cases are examples of osteogenesis imperfecta. On the other hand, osteomalacia at a later period is a rare, but probably quite different disease, possibly allied to late rickets, which, by the way, deserves more than a passing mention. The author does not recognise the importance of withdrawing carbohydrates from the diet in chronic indigestion; among the articles of food advised in mucous disease we find potatoes and various cereals. Among the omissions we noted is a description of the symptoms of adenoids in young infants. The account of congenital hypertrophy of the pylorus is poor; for some reason or another this interesting disease has not received the notice it deserves from American pædiatrists. The chapters on the nervous system, especially those on speech defects, are perhaps the best of this part of the book, but it is surely wrong to ascribe posterior basal meningitis to syphilis, while it is doubtful whether a single case of genuine disseminated sclerosis has ever been observed in infancy. The plates illustrating Mongolism are good, but Fig. 157 does not represent a microcephalic idiot in the ordinary sense of the name. It is simply a photograph of an imbecile with a somewhat small cranium. Enough, however, has been said to show that much revision is required to bring the whole book up to the standard of the section on infant-feeding.

Principia Therapeutica. By HARRINGTON SAINSBURY, M.D. London: Methuen & Co.

THIS is not a book which the practitioner will take down from his bookshelf to see if, perchance, he has left any remedy untried, any drug unused, in some baffling case of sickness. Rather is it one over which, at his leisure, he may smoke his pipe and meditate, carried along by a graceful style, with just enough suggestion of artifice to keep the attention fixed, and to give a quaint charm to the pages.

In the opening dialogue Dr. Sainsbury's position is made clear. The pathologist may scornfully point to an atheromatous valve or a cirrhotic kidney in proof that therapeutics is bankrupt: the physician is satisfied with having steered so damaged a craft safely to the harbour of old age despite lesions he had no power to check. His aim has been to preserve the balance, physiological and pathological, on which life depends. In the remaining chapters the principles of treatment are considered deliberately, wisely, and with erudition—*primum non nocere*, *secundo prodesse*, the combining of remedies, the prescription, *diatetica*, habit, the order of treatment—the chapter headings sufficiently indicate them, until finally we come to the "*imponderabilia*," as Dr. Sainsbury entitles his speculations on the old, ever new, problems, the solution of which has been the unattained object of all philosophers. A mechanical theory of the universe does not satisfy the author, any more than it does Sir Oliver Lodge—indeed, it is not hard to guess that Dr. Sainsbury has been influenced by the writings of the representative leader of English science. Matter and force explain much, but not all; what have they to say, asks Dr. Sainsbury, to the compelling influence of art, of music,—to the power of the "I believe" in moving mountains? There is, of course, no answer; he was perhaps as wise as any, who, asked what matter was, answered "Never mind," and then, what mind was, replied "No matter."

Dr. Sainsbury's book is, in a sense, literature, and we may be allowed to quote a few passages from the Epilogue: "The therapeutic obligation." ". . . he whose business it is to play at the game of quarte and tierce with Death, knows only too well that, however skilled he himself may be, his only chance is to mend his defence,—for him the attack is forbidden. In no line is his stern adversary vulnerable, and to put off the evil day when his opponent will no longer be denied, that is his only endeavour." When that day comes ". . . the obligation to protract life at any cost is not laid upon us . . . the sting of death is in the foretaste, in the anticipation, rather than in the realisation. However grim-visaged he may appear in the approaches, even unto the forecourts, in the Presence-Chamber he is wont to unmask and reveal the face of a friend. Forbidding enough 'his images and storied aspects,' whilst we contend with him for the mastery, but his victory assured and accepted, there follows peace, and for the wounds which he has himself inflicted it is his custom to administer an unfailing opiate,—in a drowsiness we take our departure. . . . He would come as a friend, let us not compel him to hostility, since he must prevail." Dr. Sainsbury's picture is nearer the truth than W. E. Henley's grisly metaphor of Death as the bully and *souteneur* of the wanton, Madame Life, "With his knee bones on your chest, And his knuckles at your throat, You may bargain, plead, protest, Clutching her petticoat." That is the grim anticipation, yet which of us physicians thinks of death in such a guise?

We are sure that all thoughtful readers will appreciate Dr. Sainsbury's erudite and philosophical essay.

The Birds of the British Islands. By Charles Stonham, C.M.G., F.R.C.S., F.Z.S., Senior Surgeon to the Westminster Hospital. With Illustrations by L. M. Medland. In Twenty Parts. Part I. pp. 40, xvi Plates. London: E. Grant Richards. 1906.

We have here the first instalment of what promises to be one of the most sumptuous of the many books on British birds—evidently a labour of love on the author's part. It is beautifully printed on handsome paper, and there are skilfully drawn, finely reproduced plates. Mr. Stonham devotes about a couple of pages to each bird, and he has aimed at describing the essential features with simplicity and terseness. He refrains from minute details which are apt to confuse the ordinary observer, and from records of abnormal plumage and the like. There is a summary of measurements and plumage characters conveniently placed opposite each plate. In the text we find in each case an explanation of the bird's name, a note on its distribution, and a short account of its manner of flight, diet, song, nest, and eggs. The first part deals with the missel-thrush, song-thrush, redwing, fieldfare, blackbird, ring-ouzel, wheatear, whinchat, stonechat, redstart, black redstart, robin, and nightingale. British birds have been described so often that there is little room left for any originality in *short* descriptions, to which the author has of set purpose restricted himself; but what is told us here has qualities of directness, simplicity, and restrained picturesqueness, with a pleasant undercurrent of appreciative admiration. The result is a beautiful book which all concerned have reason to be proud of, which one longs to possess.

Indications for Operation in Diseases of the Internal Organs. By Prof. Hermann Schlesinger, M.D. Authorised English Translation by Keith W. Monsarrat, M.B., F.R.C.S.(Ed.). Bristol: John Wright & Co.

We can confidently recommend this work as a safe and reliable guide to the practitioner, in those cases, every day becoming more numerous, in which it is necessary to decide whether or not recourse should be had to surgical intervention. The name of the professor of medicine in the University of Vienna is sufficient guarantee that the purely medical aspects of the question have not been overlooked, or the resources of medicinal therapeutics underestimated, in coming to a decision in favour of operation in any given condition. At the same time, it is evident that the author is ever ready to act in co-operation with the surgeon, when the indications he so clearly and judicially lays down are fulfilled. He is not of those who look upon surgery as a last resource in medical affections, and who seek its aid only when every art of the physician has failed. To him the knife is, equally with the drug, a therapeutic agent; each has its proper place in the healing art, and each its proper time. We have said that the indications for operation are clearly enunciated; we must add that the contra-indications and the risks involved are no less definitely stated. It may be admitted that no amount of didactic writing can solve all the difficulties which confront the practitioner in those cases which lie on the borderland between medicine and surgery, but we feel confident that after a study of the author's sections on, to take concrete examples, such subjects as appendicitis, diseases of the kidneys, gastric ulcer, or rectal affections, the physician will have clearly before his mind all the factors involved in the problem. By applying these to the data of his own individual case, he will be in a favourable position to come to what may be a momentous decision.

Mr. Monsarrat has earned the thanks of English readers for the excellent translation he has placed before them. His work has been admirably done, and the labour involved is amply justified.

Surgery: its Theory and Practice. By WILLIAM JOHNSON WALSHAM, formerly Surgeon and Lecturer on Surgery, St. Bartholomew's Hospital. Ninth Edition. By WALTER GEORGE SPENCER, Surgeon and Lecturer on Surgery to the Westminster Hospital. London: J. & A. Churchill.

IN this, the ninth edition of this popular text-book, alterations and additions have been made throughout the text, many sections have been re-written, whilst descriptions of methods now little used have been omitted. In all 126 illustrations have been added.

There can be no two opinions on the excellence of this work. In its present form it is one of the best illustrated books on surgery, while the X-ray photographs are as good as anything of the kind we have seen.

Although the book is voluminous, extending to over twelve hundred pages, some subjects are dealt with so shortly that the information afforded can be of very little use; we instance the treatment of movable kidney, which is dismissed in three lines, pneumococcal and gonorrhœal peritonitis, which together are dismissed within the space of three lines and a half, and the separation of the urines in two lines.

So far as we have been able to dip into the present edition, we have found it remarkably up to date. At the same time we have noticed one or two exceptions, for example, the treatment of gonorrhœal affections of joints by venous congestion is omitted, as a matter of fact Bier's method is not even mentioned in the index; and in the observations on the peritoneum there is no reference to Lennander's work on sensibility.

Among printers' errors we have noticed "of" instead of "off" on page 997, "ripidly" instead of "rapidly" on page 904, and "ectoppic" on page 1119. Among sentences of which it is difficult to grasp the meaning we might instance the following on page 866: "Suture of the perforation and the duodenoplasty, but especially gastro-jejunostomy in non-perforated cases, have been attended with success"; or another on page 854, "The possibility of the rupture of an ectopic gestation should be considered amenorrhœa may precede either."

The section on Ophthalmic Surgery has been again revised by Mr. Jessop, and that on Aural Surgery by Mr. Cumberbatch.

Surgical Diagnosis. By Otto G. T. Kiliani, M.D. New York: William Wood & Co.

It is a sign of the great advance of surgery that a volume of some four hundred pages can be devoted to surgical diagnosis without the addition of any extraneous matter. Whether the diagnostician can be brought into being by means of the printed page, however much illuminated by plate and diagram, or whether practical experience be a condition absolutely essential for success, are questions which may be answered according to the point of view taken; it is probable that few will maintain a supremacy of either position. It is in the fitting junction of both methods that safety is to be found. Thus there is room for a volume such as the present, which epitomises the symptomatology of the conditions met with in practice, and thus provides the medical man with an easily accessible list of the signs and symptoms to be sought for in any given case; not only this, the author incorporates descriptions of methods of examination for these symptoms, which add greatly to the value of his work.

The author shows himself to be a painstaking observer, and one who has made excellent use of the clinical material which has chanced within the limits of his experience.

Most of the plates are reproductions from X-ray photographs, some of which, however, are so indistinct as to be of little value.

It may be said of this work that, with all its merits, it is too elaborate and too bulky a tome to serve the purpose which the author has had in view. A less pretentious and more compact volume might have fulfilled his object; and though it might have added less to his reputation, would have been more appreciated by the members of a profession in which superfluous time and superabundant wealth are equally far to seek.

Recent Advances in the Physiology of Digestion. By Ernest H. Starling, M.D., F.R.S. London: Archibald Constable & Co. Ltd.

This book comprises a series of ten lectures delivered at University College, London, on the physiology of the alimentary canal and digestive glands. The lectures deal very considerably with the results of work which has been done in the physiological laboratory of University College under the author's directions. This branch of physiology has been especially identified with the name of Pawlow, whose researches in the Institute of Experimental Medicine at St. Petersburg form a basis for any work on this subject. No one is better qualified to speak of the physiology of digestion than Professor Starling, and in this small work he has given an admirable résumé of what is at present known of it, and much of our knowledge has been contributed by himself.

In the first two chapters an account is given of the physical and chemical changes which occur in the process of conversion of different food stuffs into material which can be absorbed by the cells lining the intestine. The mode of action of ferments is clearly explained. All the digestive glands are considered, but the pancreas more fully as a type. Pawlow and his school looked on the mechanism of secretion as a reflex nervous process, but Professor Starling has shown that, in some instances at least, chemical action plays a greater part than nerve impulse. The liberation into the blood of special chemical excitants or "hormones" is held to account for the setting up of secretion in most glands, and the author suggests that by the isolation and employment of such hormones we may be able to influence and control a number of the chief functions of the body.

The lectures are most instructive, no part of physiology has advanced so rapidly, and no part of it is of more importance in medicine. The book should be widely read.

Dissections Illustrated: A Graphic Handbook for Students of Anatomy. By C. Gordon Brodie, F.R.C.S. Second Edition. London: Whittaker & Co.

Mr. Gordon Brodie, when a student, found the well-known plates of Mr. Ellis so valuable as an aid to a knowledge of anatomy, that he determined to produce a more portable atlas for the use of students and practitioners, and hence the present work. While the author believes an atlas to be an aid to the study of anatomy, he remarks in the preface that the best illustration is the body itself, and that the student must lay, by careful dissection, a good and sound foundation of his anatomical work. This is certainly the case, and it is a question whether the student should have anatomy made easy by such dissections as Mr. Brodie gives in this work. The student is apt to allow the study of an atlas to replace, not supplement, dissection, and that is unsatisfactory. Anatomy has to be learnt through the fingers if it is to be permanently stored in the memory. This atlas should be more useful, we think, for practitioners than for students. The text by itself is not sufficient as a guide to dissection, and the plates are better adapted for the regional anatomy of operative surgery than for a foundation of general anatomy.

The majority of the plates are one-third the actual size of a dissection, and are unequal in merit. Possibly with a view to artistic effect, the outlines are not distinctly brought out, and definition is lost. Some are overburdened with detail, and are not readily visualised, while relative size in others seems imperfect. The text seems unsuitable for the purpose the author sets out with. Thus in the text of Plate xxiv. —"Dorsum of the Foot"—the author says the extensor brevis digitorum is an interesting example of a migrating muscle, shifting its attachment, and then devotes nearly thirty lines to its comparative anatomy. Surely this is out of place.

To produce such a work in inexpensive form is impossible, and expense is imperative for a successful atlas. While we recognise the work and care the author must have expended to produce this atlas, we think it is scarcely worth, to the student, the cost of purchase.

RECENT ADVANCES IN MEDICAL SCIENCE.

MEDICINE.

UNDER THE CHARGE OF

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Typhoid Fever.

"Typhoid Spine."—Although the affection known under this name was described so long ago as 1899, and has since received a considerable amount of attention in America and Germany, no articles on the subject have appeared in this country until very recently. Love (*Glasgow Med. Journ.*, 1906, December) reports two cases briefly as follows: (1) A male, æt. 26, underwent a sharp attack of typhoid fever, the temperature becoming normal on the thirty-sixth day. On the forty-ninth day acute pain in the lumbar region, shooting down the right leg, and greatly exacerbated by movement, was complained of. There was no sign of inflammatory mischief, and no local tenderness. Sensation was normal, but the knee-jerks were exaggerated, and there was ankle clonus. Palpation in the right iliac fossa was attended by some discomfort. This state of affairs persisted for about three months, when the pain subsided, and the patient was thereafter discharged from hospital cured. (2) A male, æt. 27, underwent an attack of typhoid, the temperature falling on the thirty-eighth day. Ten days later he complained of severe pain in the lumbar region, and said be had given his back a twist. Movement of any kind was exquisitely painful, but there was no tenderness over the spine or adjacent tissues. No fever. Sensation normal; reflexes increased, and ankle clonus present. The pain persisted for ten weeks, and there was some difficulty in walking for nearly six months. In neither case was the general health interfered with by the affection; the patients ate well, and put on weight. The exact nature of "typhoid spine" is obscure. Post-typhoid periostitis generally proceeds to suppuration, and it seems unlikely that a simple spondylitis would persist for so long a time without doing so. Neither of the patients was neurasthenic or hysterical. Love conjectures that in these cases there is an inflammation of the nerve sheaths in the vertebral canal through which the nerves make their exit; this would account for the acute pain on movement, and the exaggeration of the reflexes.

Wilson (*Med. Chron.*, Manchester, 1906, August) also reports a case, and discusses the condition. In his patient the symptoms began with aching in the back during the sixth week of convalescence. After about a fortnight the pain became worse, and resembled bad lumbago. The man could only rise from a chair if he could succeed in holding his back quite rigid, and the least movement of the spine caused exquisite pain. There was pyrexia for four weeks, and both during its continuance and after its cessation the spinal symptoms remained very acute, there being nocturnal starting pains, and muscular cramps of great severity. No physical signs of disease were detected at first. After about seven weeks the pain became less, and the patient was able to move slightly in bed. By this time a projection of the second and third lumbar spines was detected, and this increased during the ensuing month. A radiograph "showed some weakness of shadow of the second lumbar vertebra." The knee-jerks were exaggerated. A poroplastic jacket was fitted, and the patient was kept in bed for fifteen months, during the whole of which time he had little discomfort. Now, two years later, he enjoys excellent health, and is capable of any amount of exertion. There is a well-marked projection of the second and third lumbar vertebræ, but no ankylosis or stiffness of any part of the spinal column. From a study of the literature of the condition Wilson gives the following as the clinical phenomena:—*Age, Sex, Condition.*—With a single exception, all the cases have occurred in males. The average age is 25. There is often a history of an occupation requiring considerable muscular effort. *Onset of symptoms.*—Weakness and aching in the back is generally the earliest symptom; most cases begin within a fortnight of typhoid fever. *Nature of pain.*—The pain is always severe, such epithets as "agonising," "excruciating," etc., being applied to it. It is usually paroxysmal and accompanied by voluntary rigidity of the spine. Starting pains during sleep are common. The seat of pain is always the lumbar region, but it may radiate in various directions. The *duration* is from fifteen days to thirteen months; remissions and exacerbations are common; recovery is slow and gradual. *Physical signs* are generally conspicuous by their absence. Tenderness is reported in only a little over half the cases, and spinal deformity (kyphosis or scoliosis) in a third. Swelling of the soft parts occurs in about one-fifth. *Pyrexia* is present in half the cases. *Hysteria and spinal cord symptoms.*—Many patients are described as "hysterical"; both increase and abolition of the knee-jerks have been reported, and more rarely areas of anæsthesia in the legs. One patient had incontinence of urine and fæces, loss of the knee-jerk, and cramps in the legs. *Treatment.*—Rest with fixation of the spine is the best treatment; morphia is the only useful drug, and it fails in the severer paroxysms of pain. *Prognosis.*—All cases, with one possible exception, have recovered. The explanation of the condition is difficult. Gibney, who originated the name, regarded the typhoid spine as a perispondylitis affecting the periosteal and fibrous structures of the vertebræ. With one exception, all subsequent writers have agreed that it is a spinal inflammation; Osler, however, regards it as a neurosis similar to irritable spine. Wilson believes that it is a periostitis, pointing out that in its date of onset it resembles post-typhoid periostitis of other bones; when there are referred pains, the nerve roots are involved; when cord symptoms, the inflammation has spread to the vertebral canal; when marked deformity, there is also an osteitis. The great difficulty is the absence of suppuration in any case reported up to the present. The occasional pyrexia suggests that suppuration may occur, and subsequently subside.

The question of a tuberculous infection naturally arises, but it is believed that tubercle of bone is a very rare sequel of typhoid. The course is more acute, and the recovery more rapid and complete, than in Pott's disease.

M'Crae (*Am. Journ. Med. Sc.*, Phila., 1906, December) reports two further cases, and offers the first definite proof that bony changes occur. The clinical features resemble those described, and the notable points are sufficiently indicated in the author's résumé:—(1) Typhoid fever in January, followed by signs of typhoid spine; typhoid relapse in July; definite bony changes in spine; recovery. (2) Typhoid fever (paratyphoid); mild attack, onset of typhoid spine on thirty-seventh day; definite bony changes in spine; recovery. In Case 1 a radiogram showed on the right side between the second and third lumbar vertebræ, a definite deposit of bone filling up the intervertebral space. This was apparently deposited in the lateral ligament, and formed a bony union between the two vertebræ. Elsewhere the spine was normal. In Case 2 a deposit of new bone was shown by radiography on both sides between the fourth and fifth lumbar vertebræ. The intervertebral region was entirely filled up on both sides of the spine. The deposit seemed to involve both the intervertebral discs and the lateral ligaments. Subsequently the space between the third and fourth lumbar vertebræ was encroached on by a bony deposit. In discussing the more prominent symptoms, M'Crae remarks on the severity of the pain, its paroxysmal nature, and its variability with regard to the effect of pressure, to rigidity, and to radiation to the limbs, chest, and genital organs. He associates it with local changes, such as pressure from inflammatory processes, deposits of new bone, and extension of inflammation to nervous tissues. The neurotic features so frequently observed in these cases he ascribes to the demoralising effects of severe pain on a patient already exhausted by typhoid. Among the nervous symptoms, additional to those already mentioned, are paræsthesiæ, tenderness over nerve trunks, muscular spasms, rhythmical movements, muscular atrophy, and Kernig's sign. Paresis of the leg muscles may be so great as to cause difficulty in standing. There is often inability to stoop or rise, and the patients often steady themselves by resting the hands on the thighs. Œdema of the lumbo-sacral region has been noted. Neisser found that a portion of muscle removed from an area of disturbed sensation in this neighbourhood showed degenerative changes. Scoliosis has occurred in five and kyphosis in fourteen out of forty-eight cases. The bony changes in M'Crae's cases are the first reported instances of positive radiographic findings. In one of his patients he found a moderate leucocytosis. M'Crae believes that typhoid spine is due to the action of the bacillus in producing periostitic, osteitic, and perichondritic changes. He thinks that as the condition becomes more widely known, cases in which pus forms will be described. He calls his second case typhoid spine, because he considers it more reasonable to regard typhoid as a disease which may be caused by several of the typhoid-colon group of bacilli, than to make separate headings (paratyphoid, etc.) for each variety. The proof that spondylitis may follow typhoid suggests that other vertebral changes (for the condition in question does not differ materially from the osteo-arthritic type of spondylitis) may be due to infections. Spondylitis has followed scarlet fever, measles, influenza, gonorrhœa, septicæmia, pyæmia, and pneumonia.

The whole question of infectious spondylitis is fully dealt with in a critical review by Fluss (*Centralbl. f. Grenzgeb. d. Med. u. Chir.*, Jena, 1905, Nos. 17–21). In the differential diagnosis account must be taken of—(1) spinal caries; (2) acute osteomyelitis; (3) chronic rigidity of the spine (arthritis hypertrophica); (4) kyphosis from weakness; (5) syphilis of the spine; (6) malignant disease; (7) syringomyelia with kyphosis; (8) myelitis; (9) lumbago; (10) neuritis and neuralgias arising from affections of the abdominal organs; (11) neurosis. Difficulty occurs solely in mild cases.

Typhoid fever in relation to the urinary system.—An interesting case of *nephro-typhoid* is reported by Napier and Buchanan (*Glasgow Med. Journ.*, 1906, December). The symptoms were those of acute hæmorrhagic nephritis without anasarca, and the nature of the case was only detected through the discovery that the urine was swarming with bacilli, which were identified as Eberth's bacillus. The temperature curve was fairly characteristic of typhoid; the pulse varied from 80 to 100. There were neither abdominal symptoms, splenic enlargement, nor rash. The stools were formed and did not contain the *Bacillus typhosus*. Bacteriuria continued for four months from the onset of the illness. Recovery was complete. It is now known that bacilli occur in the urine in about a quarter of all cases of typhoid, and that infection can be conveyed in this way. In the case in point two of the patient's attendants contracted the disease. The *relation of bacteriuria to the kidneys* has been studied by Vas (*Wien. klin. Wchnschr.*, 1906, No. 13) with the object of determining whether there is any connection between the excretion of the organism in the urine and the occurrence of nephritis. He found that bacteriuria occurred in six out of twenty-six patients, generally between the third and eighth weeks. On the whole, it was seen chiefly in bad cases. While it was generally accompanied by signs of nephritis (albumin and casts), this was not invariable, and, on the other hand, albumin and casts occurred quite independently of bacilli. Brownlee and Chapman (*Glasgow Med. Journ.*, 1906, December) records cases of pyelitis in typhoid. In two of them temporary signs of nephritis were also present. No statement is made as to the presence or absence of bacteriuria. A full account of the histological changes in one case is given.

SURGERY.

UNDER THE CHARGE OF

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SEQUESTRATION ANÆMIA IN BRAIN SURGERY.

WITH a view to diminishing hæmorrhage in severe operations on the skull and brain, Dawbarn (*Med. Rec.*, N.Y., 1906, November 24) suggests that a considerable quantity of the blood circulating in the body should be confined in the limbs during the operation on the head. It has been shown that some quarts of blood can in this way be temporarily withdrawn from the circulation. A towel is folded and passed round each thigh close to the trunk, and upon this a rubber band is applied sufficiently tightly to prevent the venous blood leaving the limb, without arresting the inflow of arterial blood. In from five to ten minutes there is a noticeable softening and lessening of the tension of the pulse, and then the operation is commenced. In plethoric patients the upper extremities also may be constricted. The author notes the following advantages:—A striking diminution in the amount of anæsthetic required; ease of control of hæmorrhage during the operation; a shortened operation, because a dry field; less danger of sudden death from pressure on the respiratory centre; more space between the brain in the skull, facilitating manipulations.

There seems to be little risk of the congestion of the limbs doing harm, but the author suggests that if this is feared the constriction may be applied alternately to the lower and upper limbs. Before removing the constricting bands, all bleeding vessels should be secured. J. A. Wyeth and Willy Meyer confirmed the author's opinion.

PERBORATE OF SODA IN SEPTIC WOUNDS.

H. CHAPUT (*Presse méd.*, Paris, 1906, December 1) records his experience in the use of perborate of soda in the treatment of septic wounds. This substance acts in virtue of its oxidising power, 100 grms. giving off as much free oxygen as a litre of peroxide of hydrogen of twelve volumes strength. It may be used either in solution, or as a powder, or in crayons which are introduced into a wound or into the lumen of a drainage tube. The author has found it of great value in fœtid and gangrenous wounds; in cases of traumatic gangrene; and in wounds soiled with earth or street dirt, and therefore exposed to tetanus. In septic cavities, such, for example, as appendicitic abscesses, it is best used as a powder or in the form of a crayon. It may be employed as an antiseptic bath in phlegmonous suppuration, or as an injection. In vaginal conditions it is introduced into the cavity in small gauze bags, each containing from 10 to 15 grms. of the perborate of soda. As is to be expected, it has no value in aseptic wounds or in non-infective ulcers.

Génévriere (*Gaz. d. hôp.*, Paris, 1906, November 22) also expresses a favourable opinion of this substance. He states that it is neither toxic nor irritant, and that it tends to arrest capillary hæmorrhage. It is less expensive than hydrogen peroxide.

THE DIAGNOSIS AND PROGNOSIS OF GALL STONES.

FROM an experience of 1500 cases of disease of the bile passages and pancreas, Richardson of Boston (*Med. Rec.*, N.Y., 1906, November) is of opinion that the grave dangers of biliary diseases depend directly or indirectly on gall stones. The causes which lead to the symptoms of cholelithiasis are always mechanical, and medical treatment, once gall stones begin to offend, is merely palliative; operative treatment, on the other hand, if employed while the lesion is confined to the gall bladder, is curative, and is practically free from mortality. Symptoms begin to appear as soon as gall stones become grasped in an irritated and contracted gall bladder, or become engaged in the cystic duct, and while these present changes occur in the hepatic and common bile ducts and in the pancreas, which increase the difficulties of an operation. The dangers of operation are increased if the patient is jaundiced.

Referring to the diagnosis, the author points out that there is often uncertainty as to when the gall stones first begin to offend, as typical and unmistakable attacks of gallstone colic occur only in a small proportion of cases. The presence of jaundice is a valuable diagnostic sign, but too much importance must not be placed on its absence. Pain is a more constant and often a very prominent symptom; the absence of pain, indeed, makes the diagnosis of gall stones improbable, and suggests the presence of malignant disease, either in the pancreas or near the biliary tract. If the pain occurs irregularly, it favours a diagnosis of gall stones. While not prepared to recommend operation in every case in which gall stones are believed to be present, Richardson believes that on the first symptoms of impaction, however trivial, it should be advised.

The Obliteration of Cavities in Operation Wounds.

Under the above title, Mosetig-Moorhof (*Wien. klin. Wchnschr.*, 1906, No. 44) discusses his method of filling bone cavities with an iodoform mass. The mass is prepared as follows:—Equal parts of cetaceum and sesame oil are melted in a porcelain bowl, filtered, and sterilised in a water bath; 60 grms. of this mixture are poured while warm over 40 grms. of iodoform, the whole being well stirred to ensure thorough mixing. The result is a yellowish mass, which melts between 45° and 48 C. It is used chiefly to fill bony cavities the result of osteomyelitis, bone abscess, joint tuberculosis, etc., and its employment is said to shorten the period of after-treatment, prevent the formation of ugly depressed scars, and to strengthen the bone. The best way of obliterating a bony cavity is to fill it hermetically. The conditions necessary for success are complete removal of all diseased tissue, enlargement of the cavity so as to extend it into the surrounding healthy tissue to secure asepsis, and dryness of the cavity before the mass is run in. As regards the mass, it must be prepared under antiseptic conditions and be impregnated with a lasting antiseptic as an essential constituent. In order to secure hermetic closure of the cavity, it must be poured in while fluid and allowed to harden in the wound. The iodoform mass serves only as a scaffolding or temporary substitute for granulation tissue, by which it is eventually removed, or partly absorbed and partly extruded. Absorption or extrusion take place slowly, and the process can always be controlled by X-ray photography. The risk of iodoform poisoning is practically nil. The wounds always run an aseptic course if the proper precautions have been observed, and, when complete closure of wounds is possible, healing by first intention is the rule, with the best possible results from the functional and cosmetic points of view.

THE TREATMENT OF SURGICAL TUBERCULOSIS BY MARMOREK'S SERUM.

Hoffa (*Berl. klin. Wchnschr.*, 1906, No. 44) records a favourable opinion of the value of Marmorek's serum in surgical tuberculosis. He has used it both by subcutaneous and by rectal injection, and very much prefers rectal injections, owing to the absence of local or constitutional disturbance and the satisfactory results following their use. Up to the date of his paper he had treated twenty-two cases for a sufficiently long period to enable him to form definite conclusions, and he states the results in percentages as follows:—18 per cent. were cured, quickly and completely; 18 per cent. were remarkably improved; and the rest were apparently not materially influenced by the injections. The treatment never caused any exacerbation of the disease. The cases were of the ordinary clinical types, hip, knee, and ankle-joint disease, etc. The rectal injections were given daily, 5 to 10 c.c. being injected at a time. Hoffa declares his opinion that the serum is of definite value in the treatment of tuberculosis, and its complete harmlessness, and the simplicity of the method of using it, are points in its favour.

SUBSTITUTION OF THE GREAT TOE FOR THE THUMB.

Fedor Krause (*Berl. klin. Wchnschr.*, 1906, No. 48) records an interesting case where he successfully transplanted the distal end of the great toe on to the stump of a thumb, which had been amputated through the proximal phalanx sixteen years before. The patient was a working-man, æt. 21, whose earning capacity was considerably reduced by the absence of the greater part of his right thumb. He was provided with a useful thumb as follows:—The scar at the end of the stump was excised so as to expose the end of the remaining bone, which was not interfered with in any way, as a movable joint between it and the transplanted toe was desired. A transverse incision was made just behind the interphalangeal joint of the right great toe through the extensor tendon and the dorsal ligaments of the joint, and the head of the first phalanx was then removed. Into the cavity so made the stump of the thumb was inserted, and tendon, fascia, and skin united by sutures on the extensor aspect. The hand and foot were then immovably fixed together by a plaster of Paris dressing for seventeen days. At the end of that time the division of the structures on the flexor aspect of the toe was carried out, and skin, tendon, and fascia sutured as on the extensor aspect. Satisfactory union followed, and the patient was thus provided with an efficient thumb, which he was able to use freely when seen three and a half months after the operation. An X-ray photograph accompanies the report of the case.

OBSTETRICS AND GYNÆCOLOGY.

UNDER THE CHARGE OF
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The Parametrium in Carcinoma Uteri, and its Clinical Significance.

Sampson (*Am. Journ. Obst.*, N.Y., 1906, October) has made a careful study of twenty-seven specimens of carcinoma of the cervix uteri. He divides them into squamous-celled and adeno-carcinoma, the former being the more frequent, the latter being, however, more malignant, and more difficult to diagnose on account of its arising within the cervical canal. After discussing, with copious illustrations from his cases, the modes of extension, the author concludes: (1) In twenty of the cases cancer was found in the parametrium and lymph glands. (2) Adhesions from pelvic inflammation may, by causing pain attributed to the cancer, make the latter appear more advanced than it really is. (3) Direct extension into the parametrium is usually accompanied by cellular infiltration, causing induration additional to that due to the cancer. (4) The parametrium may be indurated and yet show no evidence of cancer, *e.g.* this induration may be due to hypertrophy of the connective tissue of unknown etiology. (5) The parametrium may feel normal and yet contain cancer, sometimes in thread-like extensions, so that it is only by the microscope that the presence of cancer may be discovered. (6) The pelvic glands are involved in from one-third to one-half of the operable cases, but only the microscope can determine whether they are cancerous or not. (7) A wide excision of the parametrium is, however, demanded, because it is so frequently involved. (8) In about one-half of the cases of cervical cancer there is a history of neglected uterine hæmorrhage for over six months; and even a short period of neglected uterine bleeding may permit such an extension of the growth as to make it incurable.

The Clinical and Anatomical Conditions of the Lymph Glands in Carcinoma of the Cervix.

Fromme (*Arch. f. Gynaek.*, Berlin, Bd. lxxix. S. 197) has examined glands obtained by recent operation from thirty carcinomatous patients, with the view of explaining the occurrence of fever so common in every stage of cancer. In four of the specimens he found very marked bacterial invasion. This infection, Fromme considers, may be independent of the extension of carcinoma, and may affect cancerous or merely hyperplastic glands. The origin of the fever, however, depends on serious bacterial infection of the glands, the resistance of which in that case must be overcome.

RESULTS OF THE RADICAL ABDOMINAL OPERATION FOR UTERINE CANCER.

BRUNET (*Arch. f. Gynaek.*, Berlin, Bd. lxxviii. S. 632) reviews 251 cases, in all of which the uterus, parametria, and extirpated lymph glands were examined microscopically. The operability of the cases averaged 67 per cent., but only in about 50 per cent. was there much promise of a permanent result. Brunet concludes: In every case of cancer of the cervix uteri, the whole organ with the upper third of the vagina must be removed, along with the parametria and lymph glands as far as is technically possible. The average operability for radical abdominal surgery is 50 per cent., and the average mortality 15 per cent.

ANTEPARTUM MEASUREMENT OF THE FŒTAL HEAD.

STONE (*Med. Rec.*, N.Y., 1906, November 4) uses the ordinary pelvimeters in making the measurements of the fœtal head, grasping the occipital and frontal poles between the hands, while an assistant places the ends of the pelvimeter between the terminal phalanges of the middle and ring fingers. He thinks such measurements as feasible as ordinary pelvimetry. The measurements so obtained afford a more precise method of estimating the course of labour in contracted pelvis than any other method, and one of the greatest value in the choice of cases suitable for premature induction and in determining on the best method of carrying it out.

VAGINAL FIXATION INTERFERING WITH LABOUR.

HOCHEISEN (*Berl. klin. Wchnschr.*, 1906, No. 35) reports two cases—(1) Vaginal fixation had been performed twelve years previously, and in order to effect delivery the upper part of the vagina, cervix, and anterior uterine wall had to be divided from the rest of the vagina; the child was born alive. (2) The patient had a flat rickety pelvis, necessitating Cæsarean section in 1903, and on account of vaginal fixation this operation was again successfully performed.

THE ADMINISTRATION OF MORPHIA IN CASES OF ABDOMINAL SECTION.

HAWKES (*Australas. Med. Gaz.*, 1906, August 20), from an experience of eighty-four cases in which morphia was given, and sixty-two in which it was not, concludes—(1) Morphia puts the patient in a better condition for operation, the nervous system being less liable to be affected by nerve impulses tending to produce shock; (2) the anæsthesia is quieter, and less is required; (3) there is less pain after the operation; (4) vomiting is less severe and persistent; (5) no constipating effect is produced.

PRESSURE FORCEPS TEN AND A HALF YEARS IN THE ABDOMEN.

STEWART (*Australas. Med. Gaz.*, 1906, September) reports a case where the chief complaint was ammoniacal condition of the urine, constipation alternating with diarrhœa, and paroxysms of pain. Ovariotomy had been performed ten and a half years previously. A hard body could be felt in the left iliac fossa like the rings of a pair of pressure forceps, which was confirmed by the X-rays. On abdominal section there was found an anastomosis between two points of the intestine about twelve inches apart, the rings of the forceps being inside the bowel. The forceps were removed, the intestinal wound closed, part of the omentum adherent to the old wound removed, and the patient recovered.

THERAPEUTICS.

UNDER THE CHARGE OF

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Thiosinamin in Myositis Ossificans.

Boseck reports a case of this rare condition in which injections of thiosinamin resulted in a complete cure. The patient was a young lady, æt. 22, who suffered from an attack of influenza in 1905. She was ill for three days, and suffered acutely from severe headache and acute neuralgic pain in the right side of the neck. In the course of the following seven weeks she developed a feeling of weight in the right arm, so that it was difficult to perform certain movements. At the same time she became conscious of a grating sensation in the right side of the neck. These symptoms gradually increased in intensity, and the grating became quite audible on moving the arm. There was practically no pain. When she came under the observation of Boseck in July of 1906, the condition was as follows:—There was no marked atrophy of the right shoulder girdle. The arm could be moved in all directions, but somewhat slowly. With movement there was noted distinct grating, apparently coming from the lower part of the neck. The joint itself was free from grating. On laying the hand over the right supraspinous fossa of the scapula, indefinite, hard, slightly tender strands could be felt, which on pressure gave rise to loud grating. In the middle of the left sterno-mastoid a hard bony mass was felt, which was not painful, and did not interfere with the function of the muscle. The mass was about 3 in. long and 1 in. in width. It was not movable. The other muscles were not involved. The diagnosis was made of progressive myositis ossificans. Treatment consisted in daily injection of 1 c.c. of the following solution:—Thiosinamin, 1 grm.; glycerin, 2 c.c.; water, 10 c.c. This treatment was carried out for one month, and resulted in great improvement. The feeling of weight disappeared. The grating ceased, and the hard masses were absorbed. Some months previously she had received treatment with massage, X-rays, and local application of heat, but had derived no benefit therefrom.—*München. med. Wchnschr.*, 1906, No. 48.

THE LIMITATIONS OF RECTAL ALIMENTATION.

EDSALL discusses the physiological limitations of rectal feeding. He points out that the total caloric value of the food absorbed is very limited under the most favourable conditions. It represents that of a glass of milk, and does not exceed 200 to 300 calories per diem. This amount is insufficient to keep up the patient's strength for long periods and afford proper nourishment. Frequently patients affirm that they feel much better after rectal feeding has been instituted, but this improvement may be due to psychic influence or to the better absorption of fluid and saline material. Further, the absence of the pain and discomfort due to oral feeding in cases of ulcer or cancer gives a great feeling of relief. It may, however, be stated that, at the best, rectal alimentation is a modified or partial starvation. It is better than absolute starvation, but it always entails a certain element of starvation, and this should be recognised to a greater extent than is usually done. The only cases which do really well on rectal alimentation are those in which the nourishment introduced is able to pass up the gut through the ileo-cæcal valve into the small intestine. Fats and proteids are not well utilised in enemata. Carbohydrates do better, and perhaps the best form to give them in is as dextrines, which are not irritating and seem to be well utilised.—*Am. Journ. Med. Sc.*, Phila., 1906, November.

DIPHTHERIA ANTITOXIN.

PARK and Throne describe the preparation and action of a modified antitoxin which is used extensively in New York. The serum is concentrated by the removal of non-antitoxin substances. This does not diminish its therapeutic activity, but markedly lessens the liability to serum rash, joint pains, fever, and constitutional disturbance. The part of the serum used constitutes a solution of the soluble globulins. The serum is half saturated with magnesium sulphate, and this precipitate is treated with saturated sodium chloride solution. In this way all the insoluble globulins and nucleo-albumins are got rid of, while the soluble globulins and the antitoxin go into solution. The soluble globulins are thus precipitated with acetic acid, partially dried, placed in a parchment sac, and dialysed in running water. This solution is then neutralised and made isotonic with serum by the addition of NaCl. Control tests with the original untreated serum and the prepared serum show that the latter is much less liable to cause a rash or other serum complications.—*Ibid.*

TETANUS.

THE serum treatment of tetanus is still unsatisfactory, and in many cases we must depend chiefly upon drugs. Läwen has investigated the effect of curare on the artificial tetanus of small mammals. He finds that it is able to modify the two cardinal symptoms of convulsion and reflex spasm, but it is not possible to remove all muscular rigidity, though the spasm of the spinal muscles and of the diaphragm may be eliminated for a period of several hours. The tetanus animal is rather more susceptible to the action of curare than the normal animal. An obvious fallacy in these experiments arises from the fact that the tetanus is induced by the administration of a single dose of toxin, and is not the result of a continuous absorption of fresh toxin. Still in many cases of human disease the condition is not very different, since the source of the infection may be removed by operative interference. It is not possible to convert, by means of curare, tetanus from the acute form into the slow progressive chronic form, which ends in recovery. Still, by combining artificial respiration and curare injection, it is possible to relieve or remove for hours the danger of suffocation, and this may enable the injection of antitoxin to act.—*Mitth. a. d. Grenzgeb. d. med. u. chir.*, Bde. xvi., xxxiii.

WHAT DO WE KNOW ABOUT THE VACCINE ACTIVE AGENT?

UNDER this title Paschen has an interesting article, in which he reviews the most of the work done on this subject, and communicates a preliminary report on some observations of his own. He points out that the active agent must be present in enormous numbers in lymph, since even in extreme dilution human lymph causes typical vaccination. It is probable that the germ must be small. It is able to pass through a Berkefeld filter (No. 5), but is caught by a Chamberland filter. This indicates that while small, it does not come under the category of ultramicroscopic bodies. So far, there is no evidence that the organism passes through a development comparable to that of the protozoa. Possibly the physical characters of the organism may be such that they escape our sight, owing to the fact that they only refract light very slightly. In this case photographing with ultra-violet rays may prove of use, and Paschen is conducting a series of experiments of this kind. He has also stained diluted fresh human lymph with weak Giemsa stain. The stain was used in the proportion of 1 drop to 15 drops of distilled water, and to each 15 c.c. of diluted stain 1 drop of 1 per cent. solution of K_2CO_3 was added. Films stained for two hours show an extraordinary number of very small bodies, which stain evenly. Several stages can be detected—(1) somewhat larger round bodies; (2) smaller bodies which are apparently splitting in the middle into two portions, each of which possesses a very fine threadlike prolongation which connects the two portions. At a further stage these two portions separate, though they are still connected by the fine threadlike process. Lastly, they occur separated with the fine prolongation floating free. He thinks that these bodies do not represent mere precipitates of pigment. He found the same bodies in calf lymph. The next step was to utilise Levaditi's impregnation method, which yielded such good results in demonstrating the specific spirochæte of syphilis. He impregnated a pustule from a calf and a corneal pustule from a rabbit. At the boundary of the irritation zone there is an enormous accumulation of bodies stained black, which possibly correspond to the bodies contained in the fresh lymph, since they can be seen to be joined together in pairs by a very fine connecting thread, or as free bodies with a fine prolongation. They occur all over the pustule area, but not in the deeper tissues. From silver precipitates the regularity of position and the uniformity of size are sufficient to distinguish them. In the corneal pustule, taken on the third day after vaccination, he saw in the inoculated area numerous small oval greenish-yellow vacuoles in the protoplasm of the epithelial cells, and small black bodies surrounded with a clear space. Encroaching on the nuclei are small oval structures of sharp contour, containing in their centre a black granule, and a larger form in which six of these black granules can be counted.—*München. med. Wchnschr.*, 1906, December 4.

MEDICAL JURISPRUDENCE.

UNDER THE CHARGE OF

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Poisoning by Cream Cakes.

For some years cases of poisoning by iced or cream cakes (gâteaux à la crême) have been frequent in France, and A. le Coq (*Thèse de Paris*, abstracted in the *Arch. gén. de méd.*, Paris, 1906, July 24) has published an interesting account of the investigations which have been made on the subject.

The symptoms are very uniform in character, and ensue, as a rule, about twenty-four hours after ingestion of the substance. They are choleraic at the onset; bilious vomiting succeeded by a glairy discharge, frequent fœtid stools, feeble pulse, profuse sweats, shrunken countenance, and a tendency to syncope. These symptoms are succeeded by others indicating the diffusion of a poison throughout the system, especially the nervous system; cephalalgia, pain in the back, and sometimes paralysis. Death may occur, particularly in very young or old people of feeble constitution, and more especially amongst those who have previously suffered from digestive troubles.

With reference to the causation of the toxic effects, it is now acknowledged that metallic poisons derived from cooking utensils are not responsible. Analyses made of suspected cakes, and also of the viscera of victims, have not disclosed the presence of any mineral poison in sufficient quantity to account for the fatal results, or even for the symptoms produced.

In a similar manner the toxic agent has been sought for in the flour, sugar, milk, vanilla, gelatin, and eggs employed in baking the cakes. As regards the first three of these constituents, all investigations have proved their innocence. Peytoureau has alleged that vanilla plays a great part in such cases of poisoning, but this could not be substantiated, and many cases have occurred in which vanilla had not been used as a flavouring agent. It is admitted that gelatin may perform a secondary rôle on account of its affording an excellent nutrient medium for bacterial growth, but the conclusion come to is that the toxic agent is to be found in the eggs. It is known that eggs, even fresh eggs, may contain toxic germs which are introduced into the uterus of the fowl during copulation. Ducks' eggs are in this respect specially dangerous, and, naturally, eggs which are not fresh are more liable to prove noxious owing to the presence of ptomaines. The white of an egg, on account of its employment beaten up in the form of snow, is more dangerous than the yolk, which is cooked in the process of baking; and the author advises, as a preventive measure, that all eggs used in the making of cakes should be sufficiently cooked to ensure their sterilisation.

BARBERIO'S REACTION FOR SEMEN.

THIS new test, to which reference was made in the Journal some time ago, has been subjected by Levinson (*Berl. klin. Wchnschr.*, 1906, October 8) to further investigation.

The reaction consists in the precipitation of characteristic needle-shaped crystals upon the addition of a solution of picric acid to seminal fluid, or a concentrated solution of this secretion. In contradistinction to Florence's reaction, Barberio's test appears to be specific for human seminal fluid, and is supposed to be due to the presence of protamin.

Levinson has tested the reaction on human semen which had been preserved for varying periods of time with chloroform or formalin, and always obtained a positive result. He further tested it on cases of azoöspermia, and obtained a positive reaction in all but two instances. The author calls attention to the practical importance of this fact, inasmuch as absence of spermatozoa as a result of gonorrhœal infection is by no means rare, while, at present, the sole evidence of a seminal stain depends on the finding of spermatozoa in it. In addition, the fact has to be remembered that in undoubted seminal stains it is often impossible to discover spermatozoa owing to their having been destroyed by various external influences. With reference to the secretion upon which the reaction depends, Levinson is inclined to think that this is that of the prostate in combination with that of the seminal vesicles. He obtained the secretion from the testicles, seminal vessels, Cowper's glands, and prostate from two bodies, and neither separately or in mixture obtained a positive reaction. In two instances, however, with the secretion obtained by massage of the prostate in living subjects, the addition of the picric acid solution caused a precipitation of crystals.

RUPTURE OF THE ALVEOLAR TISSUE IN THE LUNGS AS A SIGN OF DEATH BY DROWNING.

SCHMIDT (*Aerztl. Sachverst.-Ztg.*, 1906, No. 17) found in the lungs after death by drowning, areas in which the alveolæ were greatly distended, and in many places the septa were torn, resembling a condition of advanced alveolar emphysema. This he regarded as a characteristic and easily recognised diagnostic sign of death from drowning.

Leers and Horoszkiewicz in the present paper traverse this opinion, and show that the same appearances are present in all cases where well-marked dyspnœa has existed, and more especially after all forms of death from violent asphyxia. With regard to the question of drowning, they show that the condition may even arise post-mortem in bodies which have been sunk to a considerable depth in water, and that such ruptures of the lung tissue are more liable to occur as the tissues become more and more friable from putrefaction.

AN INVESTIGATION INTO THE NATURE OF ADIPOCERE.

ASCARELLI (*Vrtljschr. f. gerichtl. Med.*, Berlin, 1906, Heft 4) had the opportunity of examining three bodies which were found in various stages of saponification, and he utilised them to carry out an investigation, histological and bacteriological, into the nature of the changes produced in this process.

As is well known, the condition of saponification effects a special and characteristic preservation of the body in contradistinction to the usual process of putrefaction, and the author's object was to study the histological changes in the tissues produced by this condition, and also to determine whether or not it was influenced by bacterial agency.

The paper is full of interest and accompanied by excellent plates. The chief conclusions arrived at may be stated shortly as follows :—The histological investigation of the various tissues indicate that the nature of the process of saponification is the same in all of them. In all the organs examined the anatomical structure could still be made out, owing chiefly to the preservation of the connective and elastic tissues. Saponification is characterised by the appearance of a new substance, which gives the reactions of fat and which occupies the spaces left through putrefactive destruction of tissues. Saponification tends to advance from the surface towards the interior of the body and organs. Amongst individual organs, the skin, muscles, stomach, and intestines are those which undergo the change earliest. The most easily saponified tissue is epithelium, while the most resistent are connective and elastic tissues. Saponification is always preceded by a greater or less degree of ordinary putrefaction, which, however, is completely arrested by the production of adipocere.

As regards the bacteriology of the process, nothing positive was determined. Saponification takes place in the presence of such bacteria as are usually present in water and putrefactive processes.

The question as to the origin of the adipocere substance, that is to say, whether it simply represents pre-existing fat or results from a decomposition of albuminoid bodies, or arises from both these sources, Ascarelli does not decide, although he is inclined to the belief that albuminoid decomposition has much to do with it.

FATAL CASE OF POISONING BY STRYCHNINE, WITH RUPTURE OF THE SPLEEN.

DR. POIRSON, in the *Arch. gén. de méd.*, Paris, 1906, August 7, records an interesting case of accidental poisoning by strychnine in which the spleen was found to have ruptured spontaneously. The tragic event occurred in Tunis, and the circumstances were as follows :—In the month of May, a woman suffering from an attack of malaria took a white powder, which a druggist, after tasting and recognising to be quinine, had handed to her. Some time afterwards she was seized with convulsions, but fortunately was at once treated with emetics and recovered. In August, another woman suffering from a malarial attack applied at the store and received a similar powder. In a short time she was seized with convulsions, and in half an hour died "from syncope," according to the statements of those present, and without having lost consciousness during her seizures. The same day a law officer inquired into the case, and the person who had supplied the powder produced some of it, saying that it was quinine, and at the same time swallowing some of it. In a few minutes he was seized with convulsions, but ultimately recovered.

At the post-mortem examination on the deceased woman, the spleen was found greatly enlarged and presenting a rupture about 2½ in. long at its lower and internal margin. The abdomen was filled with blood. There were no signs of other injury or violence on the body. Analysis of the viscera disclosed the presence in them of 0·7 grms. of strychnine.

Dr. Poirson discusses the question whether death in this case was due to poisoning by strychnine or to rupture of the spleen, and whether the two conditions were directly connected with each other. Such a discussion has little medico-legal importance, and in our opinion there can be little question that the case was one of spontaneous rupture of a diseased spleen, as a result of the convulsive seizures produced by strychnine.

The Permeability of the Skin after Death to Corrosive Sublimate.

While it is well recognised that the intact skin during life offers great resistance at ordinary pressure to the penetration of watery solutions through it, yet little is known as to the permeability of the skin after death, more especially as a result of prolonged contact of fluids or after putrefactive softening of the skin has occurred. The possibility of post-mortem imbibition of poisons taking place may be of medico-legal importance, and accordingly Fränkel has undertaken the investigation of the question, in the first instance in connection with corrosive sublimate. Hofmann-Kolisko have pointed out that the opportunity of corrosive sublimate gaining access to the body post-mortem might occur during disinfection of a corpse; and a somewhat similar suggestion on the part of a doctor who was accused of poisoning his wife, led Fränkel to the investigation of the subject. In the case referred to, mercury was found in large quantity in the wife's exhumed body, chiefly in the stomach, and in smaller amounts in the intestines, liver, and kidneys. In addition, however, mercury was found in the superficial layers of the skin and also in the shroud enveloping the corpse.

As a result of experiments carried out on the bodies of newly born infants, Fränkel comes to the conclusion that, if mercury is found in any considerable quantity in the deeper layers of the skin, then, even under favourable circumstances, the question of its having permeated from without need not be taken into consideration. In all probability it has reached the tissues in some other way, such as by injection or diffusion during life.

When mercury is present as a result of post-mortem imbibition, it is confined to the most superficial epithelial layers of the skin.—*Vrtljschr. f. gerichtl. Med.*, Berlin, 1906, Heft 3.

THE MEDICO-LEGAL VALUE OF THE OSSIFIC CENTRE AT THE END OF THE FEMUR.

GUICHARD (*Thèse de Lyon*, 1905) has investigated anew the question of the value to be attached to the presence of an ossific centre at the lower extremity of the femur in the newly born.

This centre was first called attention to, as regards its medico-legal significance, by Beclard in 1819, who stated that ossification commenced fifteen days before full maturity. Subsequently, various authorities were inclined to regard its presence, and especially when it had attained a certain size, as an indication of live birth, but latterly there has been an inclination to deprive it of any significance in this respect. The conclusions which Guichard comes to are: (1) That ossification commences at the lower end of the femur on the average about the 8½ month of utero-gestation. (2) That the centre is not constantly present in infants born at full term. (3) That the diameter of the centre is very variable, due, in all probability, to modifications in nutrition or constitutional conditions in the fœtus. (4) That the centre is not always equally developed in both femora of the same child, the centre on the left side usually being the larger. (5) The centre is of great value as an indication of the maturity of a child, but there can be no question of a femoro-epiphyseal docimasia, that is to say, of regarding the size of the ossific node as a proof of live birth.

DISEASES OF THE EAR, NOSE, AND THROAT.

UNDER THE CHARGE OF

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LOCAL ANÆSTHESIA FOR THE MASTOID OPERATION AND IN OPERATING UPON THE MAXILLARY SINUS.

NEUMANN, who has perfected the method of producing local anæsthesia in operations upon the tympanic cavity, such as the removal of the ossicles, has turned his attention to a similar procedure in connection both with the Schwartze operation and the complete or radical operation upon the mastoid (*Ztschr. f. Ohrenh.*, Wiesbaden, Bd. xvii.). The method is contra-indicated in those cases where a subperiosteal mastoid abscess exists, and in patients of a nervous disposition. It is indicated in certain cardiac affections, where there is advanced tuberculosis, in cases of nephritis, and where there is diabetes.

Neumann employs cocaine and adrenalin in the following proportions:—5 c.c. of 1 per cent. solution of cocaine to which are added 12 drops of adrenalin (1–1000); 3 c.c. of physiological salt solution. The solution is not boiled, but is heated to the temperature of the body. The injection can be made with an ordinary syringe, and the fluid must be introduced beneath the periosteum covering the mastoid process. The operation should not be commenced until ten or fifteen minutes have elapsed after making the injection. This suffices for the Schwartze operation.

When the complete mastoid operation is done under local anæsthesia, the above injection is combined with that carried out for the removal of the ossicles of the tympanum, that is to say, an injection beneath the skin covering the posterior wall of the osseous meatus. A larger quantity of the solution is required. It is necessary to exercise great care in getting the posterior wall of the meatus and the cortex of the mastoid thoroughly anæsthetised. In the mastoid operations eight to ten syringefuls of fluid are used. It is suggested that the patients should be kept occupied during the operation: several of them smoked cigarettes. Neumann and Alexander performed more than twenty radical operations under local anæsthesia with success. Some pain was complained of while curetting the tympanum, but otherwise there was no inconvenience. The anæsthesia lasted an hour and a quarter or more, and the bloodless field simulated work upon the cadaver. There was no secondary hæmorrhage.

Nager has recently made a communication upon the radical treatment of maxillary sinus suppuration under local anæsthesia (*Arch. f. Laryngol.*, Berlin, 1906, Bd. xix.). In other words, the cavity is opened through the canine fossa, its interior curetted, and a counter opening made into the nasal chamber. The wound in the buccal mucosa is then sutured. The advantage of operating in this situation under local anæsthesia is obvious, provided always that a perfectly satisfactory anæsthesia can be obtained. According to Nager, this is quite possible, and he bears out the results previously obtained by von Eicken and Börger. The method employed by Nager is as follows:—Half an hour before the operation the patient receives a subcutaneous injection of morphia. He usually has had a light breakfast. The inner or antral nasal wall is well painted with 10 per cent. cocaine and adrenalin. The antrum is then washed out by means of a cannula introduced through the outer wall of the middle meatus, after which ½ per cent. solution of cocaine with three drops of adrenalin is introduced into the antral cavity through the same cannula. The buccal mucous membrane over the canine fossa is painted with cocaine, and injections of cocaine and adrenalin are made beneath the periosteum covering the fossa. Ten minutes later the operation is commenced. In reflecting the periosteum in the neighbourhood of the infra-orbital nerve, there is some inconvenience to the patient. Chiselling the bony wall does not cause pain. There is very little bleeding, and the operation is much shortened. No toxic phenomena have been noticed, and there is no reactionary hæmorrhage and no interference with the healing. We are inclined to think that a combination of local and general anæsthesia is a most satisfactory procedure, as we have found the injection of cocaine and adrenalin into the soft tissues over the canine fossa and the application of the same to the outer nasal wall diminishes the hæmorrhage, favours inspection, and curtails the operation.

THE ULCERATIVE FORM OF TONSILLITIS ASSOCIATED WITH VINCENT'S FUSIFORM BACILLUS.

THIS interesting variety of angina is dealt with in detail by Weaver and Tunnicliffe (*Journ. Am. Med. Ass.*, 1906, February 17). As mistakes may be made in diagnosis, it will not be out of place to draw attention to the paper of these authors. The primary seat of the affection is usually the tonsil, but it may extend to the gums, tongue, lips, and the soft palate, and even to the posterior wall of the pharynx and mucous membrane of the cheeks. It is, as a rule, however, a tonsillar affection. As a rule, it is unilateral: the ulcer is circular or irregularly oval. The false membrane is of a greyish or whitish appearance, sometimes yellow or greenish in colour. It is thin and friable, and can be removed without difficulty, leaving a surface slightly abraded and bleeding easily. A fresh exudation again forms after a few hours. As the case progresses the ulceration may become deeper, but does not, as a rule, tend to spread laterally. As a general rule, there is only one ulcerated area. The surrounding mucous membrane is red and slightly swollen, but later in the progress of the case there may be no inflammation present. The glands below and behind the jaw are usually swollen, but there is no peri-adenitis, and suppuration does not ensue. Other observers, however, state that glandular enlargement is rare, and this certainly forms an important diagnostic feature in these cases. The condition may heal in four or five days.

Symptoms may be almost absent, the affection of the tonsil being discovered accidentally. On the other hand, they may be both local and general. A sensation of dryness and discomfort in the throat, accompanied by pain on swallowing, may draw the patient's attention to his condition. As a general rule, there is little or no fever, but in some cases the temperature is raised. Some authors have drawn attention to an associated nasal discharge, and insist upon the importance of this in the case of children. Its presence calls for an examination of the throat.

The majority of cases occur in adults, at ages varying from 18 to 25 years of age. One author has observed the condition in young children, the youngest at the age of two years and two months. Males are more frequently affected than females, and the majority of the cases have been observed in soldiers and medical students. Weaver's and Tunnicliffe's patients were young girls. Certain predisposing causes have been tabulated, such as injury to the mucous membrane, the eruption of a wisdom tooth, dental caries, alveolar abscess, and certain infectious conditions, as scarlet fever and measles. The fusiform bacillus associated with spirilla have always been found in these cases. In making a diagnosis, it is essential to examine the membrane bacteriologically. The Klebs-Löffler bacillus has been found associated with the fusiform bacillus. In addition to a differentiation from diphtheria, it is necessary to distinguish it from syphilis.

The administration of chlorate of potassium internally is strongly recommended as a specific by some. Various antiseptic solutions have been employed locally with more or less success, but probably peroxide of hydrogen is the most useful.

THE TREATMENT OF NOISES IN THE EAR UPON A DIET FREE FROM SALT.

LERMOYEZ records (*Ann. d. mal. de l'oreille, du larynx, etc.*, Paris, 1906, November) the case of a man, æt. 76, who had suffered for eight months from noises in his left ear resembling the crackling of parchment. They were intermittent in character, but they became almost unbearable. Sometimes at their onset they caused vertigo, so that the patient was obliged to support himself. The noises could not be heard by the examiner, even with the auscultating tube. There was no evidence that either the tensor tympani or stapedius muscle was concerned in the production of the tinnitus. The hearing was defective, and low tones were rather better perceived in the left ear, in which were the noises, than in the right, which was free from them.

The difficulty was in determining the cause of the tinnitus, and, under the impression that it arose from extra-aural influences, no local treatment was applied, but the patient was instructed to modify his diet and improve his hygiene. As the result of adopting a salt-free diet, an excellent result was obtained: the tinnitus became less marked, and finally disappeared. Pierre Bonnier, who some years ago studied the influence of Bright's disease upon the ear, published an observation, which apparently did not receive much attention. In the case of a young girl who suffered from spasmodic contractions of the tensor tympani, the exhibition of a milk diet caused the total disappearance of her ear symptoms. He attributed this tonic contraction as due to some degree of renal insufficiency. In Lermoyez's case, albumin was found in the urine. He did not put his patient upon a purely milk diet, but contented himself with eliminating the chlorides. This restriction, as already indicated, proved most successful.

This question of diet has already been the subject of more than one communication in connection with affections of the ear, nose, and throat. Thus Jacquet (*Ann. d. mal. de l'oreille, du larynx, etc.*, Paris, 1904) drew attention to the remarkable effect of a salt-free diet in the treatment of chronic obstructive nasal catarrh. It proved of more value in patients suffering from Bright's disease than did any local treatment. At a more recent date, Chauveau (*Arch. Internat. Laryngol., Rhinol., u. Otol.*, 1905) has been able to modify a chronic pharyngitis by similar means, and attempted to improve the dry form of pharyngitis by increasing the chlorides in the diet. The whole subject seems worthy of further attention.

A CASE OF PERSISTENT COUGH DUE TO ECZEMA OF THE EXTERNAL AUDITORY MEATUS.

KANELLIS reports an interesting case of this kind (*Rev. hebd. de laryngol.*, Bordeaux, 1906, December 8). The patient was a young woman, æt. 26, who had been treated for some months for a cough, which, however, resisted all the usual methods of treatment. Examination of the throat revealed the presence of naso-pharyngeal catarrh, and a hypertrophied condition of the lingual tonsil. As the appearances in the throat might readily enough be accountable for the cough, local treatment was applied. A satisfactory result, however, was not obtained. The cough again became aggravated, and she complained at the same time of an unbearable sensation of tickling in the right auditory meatus and in the throat. Examination of the meatus revealed the presence of a mass of desquamated epithelium. After syringing, the meatal walls were found reddened and excoriated. The tympanic membrane was injected. On touching the excoriated surface, a cough was produced, and the disagreeable tickling was aggravated. Treatment was commenced, and though the cough continued, it was not so severe, but there was pain and tinnitus in the ear. Warm air douching was then tried, and the dressing in the meatus persevered with. The cough gradually became less troublesome, and in ten days had entirely disappeared. The meatus regained its natural colour, the tympanic membrane was no longer injected, the tinnitus disappeared, and the hearing, which had also been impaired, became normal.

PUBLIC HEALTH.

UNDER THE CHARGE OF

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Clean Milk.

A Circular recently issued by the Board of Health of the State of New Jersey for circulation among farmers, dairymen, milk-dealers, and others interested in the production and sale of milk on the commercial scale, indicates in a clear and distinct manner the duties of the milk producer and those associated with him to the general public. After pointing out that it would be a decided advantage to the consumers to receive their supplies in the condition in which the milk was secreted by the cows, even at a higher price, the circular draws attention to the common sources of contamination and the methods for prevention of that contamination. Milking should always be done with dry hands. The "filthy habit of moistening the hands with milk at the beginning of the operation, and allowing all the dirt loosened from the hands and teats to run into the milk, is a fruitful source of contamination." The use of clean overalls and caps by the milkers is also insisted upon. The use of preservatives is unqualifiedly condemned as unscientific and entirely unnecessary. "The use of preservatives," says the circular, "is a confession on the part of the user that he is too ignorant, too lazy, or too penurious to take proper care of his milk."

Further, Pasteurisation at creameries is not commended, as it is never necessary when the milk is properly drawn and handled. Such treatment (Pasteurisation) of milk may be regarded as good evidence that the milk was not clean in the beginning. It is further objectionable in that deception is practised on the customer, who thinks he is getting the clean raw milk which he is paying for. As regards the construction of byres, these should be well lighted and ventilated, the ceilings and side walls should be smooth and free from ledges and projections on which dust may lodge; 800 cubic feet of air space per animal is the minimum suggested. The floor should be impervious and the interior of the cowhouse should be kept scrupulously clean and free from all accumulation. Provision should be made to enable the milkers to wash their hands and put on clean outer garments. The health and cleanliness of the cows should be most carefully attended to, and "they should be curried and brushed daily to prevent hair, dust, and dried excreta from falling into the milk." The udder and teats should be made clean before milking. The necessity for the cooling of the milk *immediately* after being drawn is insisted upon, as well as the provision of a special apartment for the cooling process.

The measures for the prevention of contamination of the milk may be briefly summarised as follows:—(1) The outer garments of the milkers should be thoroughly clean, preferably white; (2) the milkers' hands should be clean; (3) the milk should be received in a clean pail, through a clean cloth strainer over a small opening in the cover of the pail; (4) care should be taken to avoid stirring up dust before milking; (5) the storage and transportation cans should be tightly covered to exclude dust; (6) pails, strainers, and all utensils and containers should be immersed before use in boiling water for at least half an hour; and (7) the milk, immediately after milking, should be transferred to the cans, etc., in which it is to be sent to the market, and in these the cooling of the milk should be done rapidly. All this contains little that is in itself new, but the issue of similar circulars by local authorities in this country to the milk producers, distributors, and retailers, impressing upon them the necessity for scrupulous care and cleanliness in the production and handling of milk, might lead to much needed improvement in the methods still too generally in use in the production, storage, and distribution of milk.

NATURE OF THE DUST COLLECTED BY THE VACUUM PROCESS OF CLEANING.

MARÉCHAL (*Rev. d'hyg.*, Paris, tome xxviii. No. 11) gives the results of experiments made by him as to the characters, chemical, microscopical, and bacteriological, of the dust collected by the vacuum process of cleaning. The amount of moisture in the collected dust was small, ranging from 1·35 to 4·72 per cent. He found that in the various samples of dust the mineral matter predominated, constituting from 51·8 to 95 per cent. of the dry material, while the organic matter formed from about 5 per cent. to 48 per cent. of the dry material, the average being between 43 and 44 per cent. The nitrogen when determined varied from 1·4 to 2·04 per cent. of the dry material. In the mineral matter there was demonstrated the presence of sodium, magnesium, calcium, and iron. The dust, of course, contains a large number of fibres, filaments, etc. In two specimens the relation between the weight of the fibrillary and the mineral constituents was determined. In one case with 85·5 per cent. of mineral matter there was 14·5 per cent. of fibrillary elements, and in the other case with 84·5 per cent. of mineral matter there was 15·5 per cent. of fibrillary elements. To determine the effect of the vacuum apparatus on new carpets, experiments were made, and it was found that the operation removed only a negligible quantity of dust and *no* fibres from pieces of new carpet measuring about 5 ft. by 2 ft. 3 in. This shows that fibres are not removed by the apparatus unless they are already detached, as by wearing of the carpet fabric.

When microscopically examined, the dust received in the vacuum apparatus showed, in addition to mineral matter, fibres of various kinds—linen, cotton, silk—hair, and other fibres which were determined by special staining methods to be of animal origin, and in some cases the mycelium of moulds. There were also present other elements difficult to characterise.

Perhaps the most interesting part of the paper is that dealing with the biological characters of the dust, which contained a large number of bacteria and moulds. The bacteria varied from 642,857 to 11,000,000,000 per grm. of dust, and the moulds from 66,321 to 4,333,000,000 per grm. Injection of a watery suspension of the dust into the peritoneal cavity of guinea-pigs produced no signs of disease, even after the expiry of four months. Ten centigrammes of the dust inoculated under the shaved and disinfected skin of guinea-pigs produced in all cases a local collection of pus at the seat of inoculation, but after some weeks these abscesses were completely absorbed, and the general health of the animals was excellent. In sterilised distilled water the dust is capable of undergoing fermentation with putrid emanations. Maréchal's conclusions are—(1) That the dusts which he has examined consist of organic and mineral matter, the latter predominating; (2) that, in addition to some elements difficult to characterise, fibres both of vegetable and animal origin, but especially of animal origin, are numerous; (3) that the dust is exceptionally rich in micro-organisms; (4) that, left to itself in the presence of water, a process of fermentation, giving rise to putrid emanations, is set up; and (5) that such dust extracted by the vacuum system should be destroyed by burning.

THE INTESTINAL ORIGIN OF PULMONARY TUBERCULOSIS.

In their third *memoire* dealing with this subject, in which they adduce further evidence in support of the view that pulmonary tuberculosis is due to the entrance of virulent tubercle bacilli by the digestive tract and not to inhalation, Calmette and Guérin (*Ann. de l'Inst. Pasteur*, Paris, tome xx. No. 8) consider that two conclusions of a practical nature are evolved from the experiments. The first is that by carefully avoiding the introduction of tubercle bacilli into the digestive tract we ought to be able to considerably reduce, if not to totally suppress, the causes of infection, since it is much easier to guard against the ingestion of food contaminated by bacilli of either human or bovine origin than it is to avoid the inhalation of infected dust. Hence we should vigorously prohibit the sale, and prevent the consumption of milk or milk products derived from tuberculous cows. We should also take especial care that the mouth or hands shall not be directly or indirectly soiled by tuberculous products or by tuberculous sputa of human origin. The second conclusion, which is one of very considerable interest and importance, is that an animal given in a single meal a small quantity of virulent tubercle bacilli, fine divided, certainly contracts tuberculosis, either pulmonary or exclusively glandular, or pulmonary and glandular at the same time. It reacts to tuberculin for from one to two months and sometimes longer, and is yet *curable*. It ceases to react to tuberculin when the lesions are completely cicatrised. They point out that, as a result, animals so *cured* are not susceptible, at least for a certain time, to reinfection, even when they are made to ingest much more considerable quantities of virulent tubercle bacilli. They are, as it were, *vaccinated*. On the other hand, animals which have undergone two or more successive reinfections by the digestive tract at short intervals never recover. Their lesions become aggravated and go on rapidly to caseation. These facts, the authors consider, explain the frequency with which there are found *post-mortem* in animals killed in the slaughterhouse, and in human subjects accidently killed or dying from other causes, tuberculous lesions perfectly *cured*. These animals and persons have been sufficiently rarely infected with tuberculosis in the course of their existence to have had time for their primary lesions to be cured and so become *vaccinated*. A large number of animals and persons, on the other hand, have become and remained tuberculous because they have undergone a series of successive reinfections before the lesions produced by their first attack were cured.

From their work Calmette and Guérin are accordingly led to direct their researches in the direction of obtaining vaccinal immunity against tuberculosis by introducing into the lymphatic system by the digestive tube (which they consider the normal path of infection) tubercle bacilli, attenuated, modified, or deprived of virulence.

REPORTS OF THE MEDICAL SOCIETIES.

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Edinburgh Obstetrical Society.—*January* 9, 1907.—Dr. J. W. Ballantyne, President, in the chair.—Dr. Porter read a paper on a "Case of Acute Albuminuria caused by the Pressure of a Tumour on both Ureters." Dr. Porter described the patient's illness, during which he had first felt in the right hypochondrium what he supposed was a floating kidney. Later, when acute albuminuria set in, this swelling could not be felt but in the right iliac region and in the pouch of Douglas; on vaginal examination, a tumour could be felt, which he concluded gave rise to the pressure symptoms. The tumour, on operation, proved not a kidney but a multilocular cyst attached to the broad ligament. It was concluded that it had become displaced from the abdominal into the pelvic cavity and by pressure set up albuminuria. The patient made an excellent recovery.—Dr. Eliz. H. B. Macdonald (Dundee) read a paper on "Intractable Uterine Hæmorrhage and Arterio-Sclerosis of the Uterine Vessels." She first referred to the reported cases of uncontrollable hæmorrhage and the attempts to explain them, and then considered the mode of occurrence and control of menstrual hæmorrhage. Deductions were made as to the possible causation of abnormal hæmorrhage, and the influence of the menopause on these was described. Dr. Macdonald specially discussed the changes in the uterine blood vessels and their relation to the occurrence of hæmorrhage, giving a detailed account of four cases which showed vascular changes in the uterus. The paper was illustrated by the exhibition of thirty micro-photographs.

Edinburgh Medico-Chirurgical Society.—*January* 16, 1907.—Dr. Affleck, President, in the chair.—Drs. Bruce and Harvey Pirie showed specimens of syphilitic meningo-myelitis, with photographs and microscopic demonstration.—Dr. Chalmers Watson gave a microscopic demonstration of the favourable effects of oatmeal on the thyroid gland of growing animals.—Mr. Cotterill showed a photograph of a case of enormous parotid tumour.—Dr. Byrom Bramwell showed a man who had lost the stereognostic sense after an injury to the head.—Dr. Allan Jamieson showed some improvements in cutaneous therapeutics.—Dr. Dawson Turner read a paper on "The Electrical Conductivity of the Blood and Urine in Health and Disease," which will appear in an early issue of the Journal.—Dr. Burn Murdoch read a note on the treatment of some cases by Bier's method. He had found it of great use in the treatment of a case of chronic ulcer of the leg and in some cases of acute osteomyelitis. The bandage should be tight enough to relieve pain, and may be left on for twenty-two hours at a time.—Dr. JAMES read a paper on the "Notification of Infectious Diseases." He pointed out that notification has now been in existence for twenty years, and asked of what service it had been in stamping out infectious disease? There had certainly been an improvement, but that was due to general improvement of the life of the people, and not to notification. Referring to phthisis, he said that compulsory notification was only necessary in cases where the patient's surroundings, etc., form a menace to the public health, and was not required in all cases. In many cases it would be mischievous and act harshly on the individual. A discussion followed, and the general opinion was that compulsory notification of all cases of phthisis in which the tubercle bacillus was present in the sputum was a necessary step in the campaign against the spread of tuberculosis.

GLASGOW MEDICO-CHIRURGICAL SOCIETY.—*January* 11, 1907.—Dr. JOHN BROWN in the chair.—Dr. LESLIE BUCHANAN showed two cases illustrative of "birth-injuries" to the eye, resulting in the production of cicatrices in the cornea which produced a considerable amount of mixed astigmatism, the visual acuteness, despite the use of glasses, remaining much below normal. He also read notes on a case of metastatic ophthalmitis. The patient had pneumonia in the right upper lobe, and the first signs of implication of the eye appeared on the second day after the "crisis" (which occurred on the eleventh day of the illness), and thereafter there was an evening rise of temperature, while the eye got progressively worse, going on to suppuration and phthisis bulbi. Pneumococci were obtained from the pus from the interior of the eyeball. Death occurred seven weeks after the onset of the pneumonia. After death it was seen that the lung had not quite cleared up, and that there was an ulcerative endocarditis with a vegetation about the size of a cherry. Pneumococci were obtained from the spleen pulp. — Dr. W. S. SYME made a communication on the treatment of chronic suppuration of the middle ear by ossiculectomy or otectomy, and showed patients upon whom the operation had been performed. He also read notes on two cases of recurrent laryngeal paralysis associated with old-standing tuberculous disease of the apex of the right lung, and showed a patient. The right cord was fixed, and there was associated laryngitis, which, however, had not been present when the patient was first seen five months before.—Dr. W. F. SOMERVILLE read a paper on "Neurasthenia," dealing chiefly with its treatment.

GLASGOW PATHOLOGICAL AND CLINICAL SOCIETY.—*January* 14, 1907. —Dr. J. LINDSAY STEVEN, President, in the chair.—Mr. G. H. EDINGTON showed a specimen of a perforated peptic ulcer of the jejunum occurring after gastro-enterostomy. Patient, a male, æt. 46, was operated on seven years previously by Dr. Dalziel for pyloric obstruction, an anterior gastro-jejunostomy being performed. Five years later Dr. Dalziel removed a gall-stone from the cystic duct. The patient remained free of all stomach symptoms after the first operation. Early in November 1906 he was admitted to the Western Infirmary with symptoms of perforated ulcer of twenty-five hours' duration. Mr. Edington opened the abdomen and found a perforated ulcer of jejunum just beyond the gastro-jejunal communication.—Dr. A. N. M'Gregor showed a patient who had a rupture of the vagina with protrusion of bowel, which he had successfully treated by replacement and suture. The patient, a woman æt. 63, while engaged carrying coals into her house, experienced pain and discomfort internally. She woke up in the small hours of the morning, and in getting out of bed, fell across a chair and sustained a blow on the perinæum. Immediately thereafter blood and prolapsed bowel issued from the vaginal orifice. Three days later she called in medical assistance, and the doctor sent her into hospital. On admission, a large mass of bowel was seen in front of the vulva protruding from the vagina, about the size of two closed fists. The coils of intestine were matted together with fibrinous exudate. An opening in the posterior wall at upper end of vagina was found on examination. The whole mass was carefully cleansed and replaced into the pouch of Douglas. On the fourteenth day she was allowed up, and at the end of three weeks was dismissed well. The uterus and appendages were normal but senile in character, and no uterine or ovarian tumour was present. There was no history of previous vaginal or uterine disorder, and the patient had had ten children normally.—Dr. M'Gregor showed for Dr. Jas. A. Adams a fibro-myoma of the ovary removed from a patient suffering from acute intestinal obstruction.

ANALYTICAL REPORTS.

Apollinaris Water.

There are few table waters which during a long course of years have shown such consistent excellence and proved so deservedly popular as apollinaris water, and we are glad to notice that it has recently been officially honoured by the King of Spain as well as at the Colonial Exhibition of Marseille.

Antiphlogistine.

(Denver Chemical Manufacturing Co., 110 Cheapside, London, E.C.).

Antiphlogistine has now been before the profession for some years, and has deservedly earned for itself a considerable degree of popularity. Many practitioners have found it of great value in the treatment of non-suppurative inflammations, and have come to regard it as an important addition to their methods of treatment.

EDINBURGH MEDICAL JOURNAL.

EDITORIAL.

The Tuberculosis Commission.

The Second Interim Report of the Royal Commission on Tuberculosis, which has just been published, contains results of the highest practical importance to medicine and hygiene. It will be remembered that the appointment of this Commission was largely due to an address by Koch at the Tuberculosis Congress in 1900, in which he stated that human and bovine tuberculosis are practically distinct diseases, and that the measures taken to prevent infection of the human subject from the bovine species are practically unnecessary. His conclusions were chiefly based upon certain experiments which showed the non-susceptibility of the ox to tubercle bacilli obtained from the human subject, and on, as he supposed, the rarity of infection of the human subject by the alimentary canal. It should be noted, however, that his conclusion with regard to inoculation was largely confirmatory of what had previously been established by Theobald Smith, while his opinion with regard to intestinal infection was contrary to the opinion of most pathologists. The explanation of his experimental results will be readily gathered from what follows below.

The present report is chiefly occupied with a comparison of the bacilli obtained from human and bovine tuberculosis, both as regards their cultural characters and as regards their pathogenicity. In the first place, the characters of bovine tubercle bacilli are carefully described, thirty different strains of the organism being used, and the description is afterwards used as a standard for comparison with the bacilli from the human subject. The bovine bacilli are found to be highly virulent to various animals, producing, as a rule, a progressive generalised tuberculosis in guinea-pigs, pigs, and apes. Inoculation of the bovine species produces sometimes an acute tuberculosis, sometimes a limited retrogressive tuberculosis, or, again, effects intermediate between these two. It is to be noted that this bacillus is even more virulent to the animals first mentioned than to the ox itself. The members of the Commission have then studied tubercle bacilli obtained from about sixty cases of the disease in man, and from a careful comparison of their characters have arranged these bacilli into two chief groups — Group I. and Group II. The former of these groups is considerably smaller than the other, and comprises the bacilli obtained from fourteen cases out of the total number. The bacillus of this group invariably produces acute progressive tuberculosis in the same animals as those in which the bovine tubercle bacillus does, whilst in the ox its pathogenic effects are the same as those mentioned above. In fact, it is stated definitely that the pathogenic effects of these two organisms appear to be absolutely identical. The bacillus of Group II., however, differs in certain respects from that of Group I. It is an organism of distinctly lower virulence, inasmuch as it does not, even in very large doses, produce progressive tuberculosis in the ox; the lesion in every case, on the contrary, undergoes retrogression and healing. Experiments performed on rabbits, pigs, and goats give pretty much the same result. In the case, however, of highly susceptible animals, such as guinea-pigs and monkeys, a generalised tuberculosis results from the inoculation. Coming now to the cultural characters, we find again a similarity between the bovine bacilli and the human bacilli of Group I. All these organisms flourish somewhat scantily on various culture media, and ·they show a comparative uniformity in their appearance and size. The human bacilli of Group II., however, differ in giving a much more luxuriant growth on different media, and also in showing greater variations in their morphological appearances. It should be noted, however, that the bacilli in either of the two groups are not completely alike, but present certain variations; accordingly some of the bacilli of one group do not differ greatly from some in the other. The terms *dysgonic* and *eugonic* are employed to denote respectively that a bacillus grows with difficulty or with readiness on a culture medium. A summary of these results may accordingly be given by saying that the bovine bacilli and the human bacilli of Group I. are dysgonic and highly virulent, whilst those of Group II. are eugonic and distinctly less virulent. In other words, in a certain proportion of cases (the minority) of human tuberculosis, the bacilli are indistinguishable by any means at our disposal from those obtained from tuberculosis in the ox, while in the majority the bacilli differ to a slight degree in pathogenicity and growth characteristics. These differences are clearly stated, however, by the Commissioners to be quantitative rather than qualitative, and moreover are not of permanent character. They found, for example, that a bacillus obtained from human tuberculosis, on being passed through the tissues of the calf, might gradually acquire the characters of the bacillus of bovine tuberculosis, that is, might become dysgonic and more virulent, so as to produce acute general tuberculosis in the ox on inoculation. This result is what might have been expected in view of what Nocard found with regard to avian tuberculosis. The bacilli of mammalian and avian tuberculosis are recognised to differ markedly in their cultural characters, and especially in their pathogenic effects, and were considered by many to be two quite distinct species. Nocard, however, by growing the human tubercle bacillus in small collodion sacs in the peritoneum of the fowl for a considerable period of time, succeeded in inducing this organism to assume the characters of the bacillus of avian tuberculosis. It is thus very probable that bacilli from the ox will, after growing in the human tissues for some time, come to assume the characters of the bacillus of Group II., and conversely that organisms of the type of Group I. have not sojourned for any great length of time in the human tissues.

When we come to examine the sources of the bacilli of Group I. and Group II. respectively, we find facts which complete the proof of the transmissibility of tuberculosis from the ox to the human subject. In Group I. the bacilli, with one exception, were obtained either from cases of tubercular cervical glands, or from the lesions of primary abdominal tuberculosis, that is from cases where there was a clear indication of infection by alimentation. The conclusion, therefore, seems irresistible that the organisms in these cases were bovine tubercle bacilli which had been transferred from the bovine species to the human subject. In Group II., which includes fully forty cases, there are some cases, although a minority, in which the disease seemed to be of alimentary origin, though the bacilli were of the eugonic, or more strictly human type. In view, however, of the facts regarding modifications of the bacilli in the tissues of the bovine species, it is likely that the bacilli of Group I. will in the human tissues soon acquire the characters of Group II.; although at present we have no facts to show what period of time is necessary for this change to occur. It is noteworthy that in a considerable proportion of the cases of human tuberculosis the disease is stated in the report to be of alimentary origin, and observations of the writer carefully carried out in recent years have given a similar result. This is in direct contradiction to Koch's declaration in 1900, and there can be no doubt that on this point he fell into grave error—an error which was in part due to his assuming that the presence of any pulmonary lesion was evidence that the *primary* infection had taken place through the respiratory passages. One question might be asked in this connection, namely—What is the relative virulence of the bacilli of Group I. and Group II. respectively to the human subject, are the bovine bacilli more virulent or less virulent than those from the human disease? Manifestly an answer to this question cannot be supplied directly from experimentation. It appears that the bacilli of Group I. are more virulent to all the animals tested, including apes, than those of Group II., but it does not follow that this higher virulence obtains also towards the human subject. In fact the comparative chronicity in many cases of the caseous tuberculosis of lymphatic glands in children, where there has been an alimentary infection, would almost suggest that the bacilli concerned, in all probability derived from milk, have rather a low order of virulence at first. It would be difficult to arrive at a definite conclusion on this point, and, after all, it is not a matter of great moment from the practical point of view—what is of importance is that alimentary infection with bovine tubercle bacilli is of comparatively common occurrence in children.

The bacilli in bovine, and human tuberculosis must thus be regarded as one and the same organism. By continued sojourn in the tissues of the ox or of the human subject, the organism becomes modified to a certain extent so as to acquire the characters of one of the two groups above described. The fact of outstanding importance, however, is that in some cases of the human disease there are present bacilli which have all the characters of the organism when growing in the bovine species, and these are specially cases where evidence of recent transference from the ox is present. The results carry us back, so far as concerns the preventive measures demanded, to the position occupied before Koch's address. The opinion then generally held must now be considered as proved. That tuberculosis is transmissible from the ox to man, that it is transmitted in a considerable proportion of cases, and that the vehicle of transmission is the milk of tuberculous cows, must be now regarded as thoroughly established scientific facts. Legislation in this matter has been too long delayed, but it cannot fail to follow speedily the publication of this report, and we have little doubt that it will be, as it ought to be, of a stringent nature. The labours of the Commission have extended over a period of time which may to many appear unnecessarily long, but when we consider that altogether about ninety strains of tubercle bacilli from different sources have been studied, and bear in mind the time necessary to give growth characteristics and experimental results, the period over which the work has extended becomes no longer surprising. The practical measures of prevention which are clearly pointed to by the scientific facts should, if properly followed out, result in distinct diminution in the number of cases of tuberculosis, and if this is the outcome no one will question that the time and labour have been well spent.

We cordially congratulate Professor Donald MacAlister, and still more cordially the University of Glasgow, on his selection to succeed Professor Story as Principal of the great University in the West. The University is to be specially felicitated in not only having obtained the guidance of a Principal who is eminent in many branches of learning, and experienced in matters of education and the management of public affairs, but also in having secured a Principal whose whole life has been devoted to the scientific aspects of Medicine, and who is therefore qualified to develop the medical affairs of the University on lines which could hardly be looked for when the office is filled by a theologian, however eminent he may be.

There can be no question that the Scottish Universities must put their houses in order, so as at least to keep abreast with the progress of scientific and medical education, which is so prominent a feature in the Universities of other parts of the world, and we feel sure that in its new Principal Glasgow has got the very best man to originate and carry through the necessary reforms.

We have to record the resignation by Dr. Andrew Davidson of the Lectureship of Diseases of Tropical Climates.

To Dr. Davidson is chiefly due the credit of instituting teaching in this important branch of study in Edinburgh, and of securing the provision of the "certificate in diseases of tropical climates," which has greatly aided our students in the competition for appointments in the Crown Colonies and Protectorates.

Since he first began his course of lectures, the study of tropical diseases has advanced with leaps and bounds, and has assumed an importance which a few years ago would hardly have been credited. No medical school of the first rank can dispense with special teaching in the subject, and the necessity for such instruction exists more particularly in Edinburgh University, to which so many students from all parts of the world annually direct their steps.

The provision of a strong Department of Tropical Diseases is therefore a matter of prime importance for us, and it is to be hoped that the vacancy caused by the regretted resignation of Dr. Davidson will be filled by a man whose reputation and practical experience will tend to place the recently instituted "diploma" in Tropical Medicine in a position which will make it sought after as a distinction, and regarded as a guarantee of high culture in the special department.

The present occasion for such an appointment is opportune, and we trust that the ways and means may be found to attract a thoroughly capable man to the position.

Since the departure of Dr. Noël Paton to fill the Chair of Physiology in Glasgow, the laboratory of the Royal College of Physicians has been without a superintendent. Many have been surprised at the delay in filling up the vacancy, which, however, did not arise from any dearth of capable men, but rather from the desire to obtain the very best possible successor to the two previous distinguished directors of the laboratory, Professors Sims Woodhead and Noël Paton. It is universally acknowledged that the appointment of Professor James Ritchie of Oxford more than fulfils the hopes which have been expressed that some one of outstanding merit and ability should be chosen.

We cordially join in expressing to Dr. Ritchie the general feeling of gratification with which his return to the Alma Mater is hailed—a return which we trust will be associated with many more years of life devoted to high purpose and successful research, and which, we venture to hope, will be fraught with happiness for himself.

THE appointment of Dr. J. M. Beattie to the Professorship of Pathology in the University of Sheffield will give great satisfaction to his many friends.

Dr. Beattie became Senior Assistant in the Pathological Department of Edinburgh University when Professor Welsh went to Sydney, and since 1901 he has held the post of Lecturer on Pathological Bacteriology. The manner in which he discharged these duties has done much to maintain the reputation of pathological teaching in the University, and met with general acceptance from the students.

THE Meeting of the Edinburgh and other Scottish branches of the British Medical Association was held on the 22nd February. The museum, which was displayed in the Pathological Department of the Royal Infirmary, was of a remarkably interesting and instructive character. Demonstrations were given in the Electrical Department by Dr. Dawson Turner; in the Lock Wards, by Mr. Alexis Thomson; in the Eye Department, by Dr. George Mackay; in the wards for the treatment of delirious patients, by Dr. William Russell; and in the Surgical Out-patient Theatre, by Mr. Alexander Miles.

The clinical meeting was held in the afternoon in the University Clinical Medicine Theatre, under the presidency of Professor Chiene, and the day's programme was completed by a dinner in the North British Station Hotel.

ORIGINAL COMMUNICATIONS.

CEREBRO-SPINAL FEVER.[1]

By WILLIAM OSLER, M.D., F.R.S., *Regius Professor of Medicine in the University of Oxford, Honorary Professor of Medicine in Johns Hopkins University, Baltimore.*

I HAVE been asked to speak to you on the subject of cerebro-spinal fever, a disease in which I have been interested for some years, and of which I have had some experience. It possesses many most interesting characteristics as an epidemic. Let me call your attention to one or two peculiarities of infectious diseases in general. In the first place, a large proportion of them occur in cycles. Nearly all the common epidemics have periods of great prevalence, followed by intervals in which only a few cases occur. Certain of them, even the greatest, may disappear for very long periods. Had we not all thought that we had finished with the plague? Who would have thought ten or fifteen years ago that we should ever again think seriously of a great pestilence? Yet to-day there is no more important problem in epidemiology than the plague in India. The sweating sickness, that great epidemic which devastated Europe in the Middle Ages, has disappeared altogether. Then epidemics present curious seasonal variations of which we have as yet no very satisfactory explanation. For instance, enteric fever occurs chiefly in the autumn. The exact cause of these remarkable variations we do not know.

The particular disease I am to speak of, cerebro-spinal fever, illustrates in a remarkable way a number of epidemic peculiarities. It has occurred in remarkable periodic waves ever since its recognition, and its first description, in 1805, in periods usually of ten or fifteen years. The 1805 epidemic began in America, prevailed in Switzerland, and in one or two other parts of Europe, and lasted for eight or ten years. The second outbreak began in 1837, and became widely prevalent in parts of Europe and America. About 1850 there was a third definite epidemic wave, which was even more widespread, and which prevailed all through the period of the Civil War in America.

A fourth epidemic began in 1871, and about 1901 arose the fifth wave, on the crest of which we are at present. The disease has prevailed in many parts of America. In New York, for instance, in the past two years there have been nearly 4000 cases of this disease, with some 3000 deaths. There has been a severe epidemic also in Silesia and other parts of Europe. In these islands the disease has never been very prevalent. In Allbutt's "System" you will find a list of the epidemics given in Ormerod's excellent article. The only serious one was the Irish outbreak in 1866–67. A few isolated epidemics have occurred, but there have been no such severe manifestations of the disease as on the Continent and America. At present the disease has broken out in Belfast and in Glasgow, and is causing no little alarm. A second peculiarity is that the epidemics occur in very widely separated areas, in which it prevails severely, but does not spread widely. This is one of its most remarkable peculiarities. During the past two years in which it has prevailed in parts of the United States, the epidemic, for example in New York, did not spread to other large cities, nor did it extend throughout the country. At the same time, the disease occurred in such a widely distant region as Silesia. This has been a very constant peculiarity. The disease is never pandemic, like influenza, sweeping rapidly over many countries. It occurs usually in small localised regions, scattered far apart. It has another peculiarity in showing a maximum intensity in densely populated cities, as in New York, and in scattered mining towns and villages and in mountainous regions. Some of the most severe epidemics in the United States have occurred in the mountains of West Virginia, in the mining regions of Pennsylvania, and last year one of the worst epidemics on record was among the Silesian miners. A fourth peculiarity is that the mortality, as an acute infection, ranks very high, perhaps next to the plague. At times, indeed, it equals the plague as a killing disease. The latter disease has a mortality of 60 and 80 per cent., and cerebro-spinal fever has a mortality ranging from 50 to 75 per cent. Lastly, among infections it is perhaps the most virulent. We know of no disease which can strike patients with such lightning-like rapidity, in so fulminant a manner, as cerebro-spinal fever. There are instances in which death has occurred within six or eight hours. A few years ago, in Washington, I saw a robust, healthy man who had left his house immediately after luncheon, and who, as he was stepping out of a tramcar at about 2.30 P.M., had a sudden pain in the back of his head. I saw him that night at ten o'clock. He was in a condition of extreme prostration, with high fever, violent delirium, and with a temperature of 104°. At three o'clock in the morning he was dead, within a little more than twelve hours from the onset. On the other hand, there is no known infection which may so lightly affect a patient. When the disease is very prevalent there are curious mild attacks, with the most transient manifestations. The patient has a headache for an hour or two, a pain in the back of the head, a little stiffness in the neck, and the whole affair passes off in a few hours; and yet there are gradations between these extremely light attacks, in which a man is scarcely more than out of condition for an hour or two, and the most serious of all the forms.

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[1] An Address delivered to the students in Edinburgh on Friday, February 8, 1907. Communicated by the author.

The specific germ associated with it is known as the *Diplococcus intracellularis meningitidis*. It has been found only in two localities, in the exudate in the brain and cord, and in the secretion of the back part of the nose and the throat, and this is a very important matter in connection with the spread of the disease. For instance, Ostermann last year examining twenty-four throats of persons who had not the disease, but who were exposed to it, *i.e.*, who were attending upon patients, or who had been in their neighbourhood, out of these he obtained the organism from seventeen, showing that it is a widely diffused germ, and probably many throats during an epidemic harbour it, as so many of us do the pneumococcus. Indeed, the organism is a near relation to this germ, a sort of cousin perhaps, possibly a half-sister, at any rate a very close relation. The disease has, indeed, many points of resemblance with pneumonia. One remarkable feature has been brought out of late years. We have hitherto regarded cerebro-spinal fever as an epidemic, but we now know that a certain type of meningitis, the posterior basic, is due to the same organism, so that in reality cerebro-spinal fever, while not occurring as an epidemic, does exist in this sporadic variety all over the country.

From recent bacteriological studies, there can be no question that this so-called posterior basic meningitis, described by Gee and Barlow and well known in this city, represents the sporadic form of the disease. It occurs constantly in the community. There are cases in the Children's Hospital of this city every year: indeed, there are cases there now: and it also occurs in those peculiar house-epidemics, which may prevail in the absence of any special outbreak. Two or four or even five persons may be stricken one after another in the same house with the disease. There are also sporadic forms of the pneumococcus meningitis which occur in these house-epidemics.

An important point which has been discussed in all the epidemics is whether the disease is communicable directly from person to person or not. Is it actually contagious? Do we run any risk in looking after the patients? It probably has the same low degree of contagiousness that we see in pneumonia. It sometimes happens if you have a case of pneumonia in a medical ward, a case will occur in the neighbouring bed, or one of the attendants will be infected, or there may be a small ward epidemic, or in a house one case is followed in rapid succession by three or four other cases. Cerebro-spinal fever behaves in much the same way. Numbers of cases may be in the general ward of a hospital, and the disease may not spread. We had no additional cases in the Johns Hopkins Hospital in a small epidemic there, either among the attendants or among the nurses. On the other hand, there have been instances which demonstrate clearly that the disease may be communicated from one person to another. In New York both nurses and physicians were attacked, and there were many cases illustrating the communicability of the disease. A very striking case has been reported by Dr. Hare, whose writings you all know. His assistant, a young physician of 26 or 27 years, and a very strong, robust man, attended a case of cerebro-spinal fever. As the patient was a friend, he was very devoted, and sat up with the poor fellow until his death, after an illness of forty-eight hours. This man had just come from a region in which cerebro-spinal fever was prevalent. Within twenty-four hours of the death of his patient, the doctor was attacked, and died within forty-eight hours from the onset of the disease. Dr. Hare, who had seen the original patient, and had attended his assistant, a day or two later had a slight fever, with headache and stiffness of the neck; but fortunately the attack passed off with great rapidity.

There are certain features of cerebro-spinal fever which make it rather peculiar among the forms of meningitis. It is much more a spinal affection than any other form, so that it is well called *cerebro-spinal* meningitis. In the tuberculous and in the pneumococcus forms the cerebrum is very much more involved than the cord, but in this disease the spinal meninges bear the brunt of the attack, so that we have as special symptoms the stiffness of the neck, the muscular rigidity, and the cutaneous sensitiveness. In the ordinary forms of meningitis we rarely see the great retraction of the head and the opisthotonos as we do in cerebro-spinal meningitis. There is a much greater variation in the course, and in the symptoms, in this form. For example, we rarely see a malignant acute form in which death occurs before there is any cerebro-spinal exudate; nor do we often see, except perhaps in the pneumococcus form, a chronic type. The disease may last for two or three months. Most remarkable of all is a feature which distinguishes this from all other varieties of meningitis—in fact it is the silver lining in the meningitic cloud—from 25 to 50 per cent. of the cases recover. We never see recovery in other forms of meningitis. In tuberculous meningitis one hears of a recovery, and recovery we know is possible, but the cases are so rare that a man may practise for forty years and not meet such a case. And the same is true of the streptococcus and staphylococcus varieties. All forms indeed are fatal except this one, due to the *Diplococcus intracellularis meningitidis.* Of course the percentage of recoveries is not a large one, varying perhaps from 20 to 40 per cent., but when one considers that all the other forms are fatal, we must be thankful that there is this peculiarity in the disease.

I will not deal specifically with the symptoms of the disease, but there are one or two peculiarities to which I may refer, as they are of interest. There are curious skin lesions: the purpura which has given the name "spotted fever," the erythema, occasionally bullous eruptions and remarkable blotchy rashes about the joints. The skin eruptions vary in the different epidemics. Arthritis is a not infrequent feature in some epidemics. A very serious event is early blindness or early deafness, which form calamitous sequels of the disease. Connected with the deafness in the very young is the dumbness; and von Ziemssen states that following the great epidemic in Germany in 1871 there was a considerable increase of persons admitted to the Deaf and Dumb Asylums. The diagnosis of the disease is rarely in doubt. The symptoms are those of meningitis, and the distinction from the other forms can only be determined in two ways,—by the detection of the diplococcus in the serum of the spinal meninges, or by the fact that a person recovers who has had a marked and well-defined attack. When there are clearly defined symptoms of meningitis, if recovery takes place the chances are 100 to 1 in favour of its being a meningococcus infection. The discovery of the organism is made by the lumbar puncture, which is not a difficult operation, but the meningococcus may be present only in the early periods, and at the end of a week or ten days it may not be found.

A most important point concerns the prophylaxis of the disease. In the first place, we need not be apprehensive, I think, that there is to be a widespread epidemic in this country. The newspapers should not alarm the public unnecessarily. There has as yet been no widespread epidemic in Great Britain, and there is no reason why we should anticipate one. The immunity of these islands during the past century is very remarkable; the only epidemics really worthy of the name have been in Ireland. Usually it has prevailed only as it is occurring to-day in Glasgow and in Belfast: a hundred or more cases in large populous cities. The disease does not often prevail much beyond the winter season. It usually disappears in the spring. Where the disease is prevalent, persons in the neighbourhood of patients, the attendants and others, should have their throats carefully examined bacteriologically, and as far as possible the nose and throat should be carefully treated. This might sometimes prevent a person taking the disease, and it might stop the spread of the germ from one person to another. Not much can be said on the treatment of the disease. As with the plague, a disease which kills 75 per cent. of the persons attacked is not one for which treatment does much. But as it is the only form of meningitis in which we do see recovery, there is an element of hope, and certain measures of treatment may be carried out. The hot bath frequently repeated may be used with very great benefit and comfort to the patient. Lumbar puncture, more particularly where the fluid comes out under high pressure, should be frequently repeated; I have seen undoubted good results, and it is a harmless procedure. Or continuous draining may be tried, or one or two of the spinal laminæ may be removed. I had it done in one case with temporary benefit, but it is rather a serious operation. One hopeful feature about cerebro-spinal fever is that within the past year, Wassermann in Germany, and at the Rockefeller Institute of New York, Dr. Flexner, have prepared a serum which promises to be of great value both as a prophylactic and as a curative measure. The disease may be reproduced in monkeys, and the serum has cured them; and these workers have also been able to render monkeys immune. A serum prepared from the horse is in the market, and which is claimed to be of very considerable value. These are the main points about this remarkable disease. Some of you may never see it in epidemic form, but the sporadic cases are always with us, and I am very glad to have had this opportunity of calling your attention to it.

ON INSANITY, WITH SPECIAL REFERENCE TO HEREDITY AND PROGNOSIS.[1]

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Lecture 1.—Prolegomena.

"*There are some authors whose only design and end it is to give an account of things that have happened; mine, if I could arrive unto it, should be to deliver what may come to pass.*"—Montaigne, Bk. I. Chap. xx.

In the daily routine of medical work we are called upon to deliver what may come to pass. The constant weighing and measuring of our observations and experience lead us naturally to an estimation of probabilities. Recovery or death, success or failure in the appointed strife with disease, that is the momentous question to which the physician must endeavour to find an answer. Things have happened: what is to come to pass? Much of skill in prognosis is personal, empirical, and incommunicable; but as our science advances, with the contributory aid of all the sciences that are subordinate to the master art of healing, so, in just proportion, our premonitions will be determined.

In no kind of disease is prognosis more doubtful than Insanity. For long overshadowed by ignorance and superstition, for long regarded as a mysterious calamity, for long obscured by confusing issues, it is only of late years that the fundamental truths have been disengaged from the fantastic phenomena which formerly dominated the attention of the observer. The tedious melancholy, the violent excitement, the bizarre ideas, and the dangerous conduct of the insane wholly occupied attention, and precluded the study of obscure and elusive bodily conditions. The mere recital of aberrant talk and morbid conduct long detained us with mere irrelevancies. Metaphysical discussions of mental aberrations issued in a reiterated confirmation of Bacon's dictum—"What was a question once, is a question still." Pathological researches were not unknown. There is no indication of the reasons which led James Murray to devote his fortune to the humane purposes of the Perth Royal Asylum; but it is possible that his uncle's work may have influenced him at a time when Scotland had awakened to a recognition of the public duty towards the insane, a time when public and private beneficence flowed strongly in that direction. His uncle, Dr. Marshall, practised medicine and lectured on anatomy and surgery in London. His posthumous book was published in 1815, under the title, "Morbid Anatomy of the Brain in Mania and Hydrophobia."

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[1] The Morison Lectures, delivered before the Royal College of Physicians, Edinburgh, January 1907.

Since then, work in this sphere has been incessant and arduous, until, at last, there are indications that more is to be gained by research applied to the living body, rather than by perseverance in morbid anatomy. Not that this is a new departure, for the oldest English writer on insanity, Dr. Timothy Bright, in his "Treatise of Melancholie" (London, 1586), discourses at great length on the somatic conditions, and especially on gastro-intestinal disorders, because "melancholic appetite is not proportional to their digestion."

It is unnecessary to discuss the history of medical literature dealing with insanity, until the memorable publication of Schroeder van der Kolk's "Lectures on Mental Diseases," which took shape about the middle of last century. He arrived at the conclusion that much insanity is due to morbid conditions of the great intestine. In accordance with the medical ideas of his time, he described this class of cases—*Sympathetic Insanity*. While he clearly recognised the brain as the organ of mind, he believed that it is liable to disturbance in direct consequence of somatic conditions, influencing it in a secondary manner.

This conclusion was widely supported, and here, in Edinburgh, the influence of the body on the mind was definitely fixed and crystallised by Skae's classification of mental diseases. Dr. Skae had the advantage of an able and clear-sighted colleague in the late Dr. Howden, so long physician to the Montrose Royal Asylum, and the earlier work of Schroeder van der Kolk was thus developed along lines which are still sufficiently familiar.

But the trammels of metaphysics were not to be readily shaken off. Even Dr. Maudsley's epoch-making books, tending to freedom of thought, as they did, left the position doubtful. Professor Laycock devoted his arithmetical powers to an enumeration of the brain cells in order to arrive at the possibility of a sufficient number of cells capable of each containing one idea. Futile questions are still demanded as to the intimate nature of the thought.

The traditions of men die hard. Every now and then a case of witchcraft is reported in the newspapers, yet it is 350 years since Reginald Scot wrote his famous book on the "Discoverie of Witchcraft." I had occasion, some time ago, to show how ancient beliefs survive in modern minds, and remain apparently indelible. Quite lately, an obscure book reached me, and I make no apology for quoting part of the title-page: "Hidden things brought to light in reference both to the upper, middle, and lower worlds, or the true millennium only to be enjoyed in the new or renovated earth; also new discoveries in antiquities, with illustrations of those formerly discovered; together with a truly interesting narrative of a man under demoniacal possession, with the discovery of a remedy for the nightmare." Notwithstanding the old-world suggestion of this lengthy description of contents, the book was published at Edinburgh in 1843, by the Rev. Andrew Small, LL.D., of Abernethy, who set to work because "these demoniacal possessions are come to an alarming height, and are obviously the cause of filling the Lunatic Asylums." Needless to say, Satan had a very poor chance with the LL.D. as is his fate in these tales of demoniacal possession, and the cure was to be found in securely plugging up all the holes in the walls of the chamber of the afflicted person, in order to prevent the demons from gaining access.

It is almost impossible to gain any useful information from old asylum records. In the earliest series, the recorders note the reception of a lunatic, and briefly indicate that he was furious or fatuous, sometimes adding an account of heroic doses of medicaments, blistering and bleeding, and sometimes an indication of removal by death or otherwise. The man was mad, and there's an end on't. At a later period, the cases are described as psychological curiosities—how they arrived on foot or in a carriage, how they displayed their morbid ideas, how they wrote, and how they behaved. But withal the most chary record of physical disorders, the most elusive statements as to family or personal history. In brief, it was the study of mind apart from body—the psychological content. Having arrived at the conclusion that there is no pathology of insanity, comment on somatic conditions was, of course, superfluous.

It is to be regretted that these methods persisted so long, indeed preventing other than the baldest facts available for a survey of the insanity of the period; yet it would be discourteous and ungrateful to ignore the work that was done, just as we cannot but acknowledge the excellent intentions and practical beneficence which inaugurated and maintained the Royal Asylums of Scotland throughout the earlier years of the nineteenth century.

For example, the blood of the insane is the *dernier cri* of the modern investigator. My predecessor, Dr. Lauder Lindsay, so long ago as 1854, published a series of observations on the "Histology of the Blood of the Insane," which he had made in the Crichton Royal Institution, then under the direction of Dr. W. A. F. Browne. He did not claim that his researches elucidated the morbid conditions of mind, or its organ, the brain; but rather illustrated the laws of pathology, the natural relations of healthy and morbid states of mind and body, and more particularly the reaction of physical diseases on mental phenomena. The résumé was presented under fourteen headings, the fourth being to the effect that a leucocythæmic condition frequently exists. As examples of this, cases of general paralysis, acute mania, and melancholia were cited. Unfortunately, Dr. Lindsay concluded that there was no connection between the state of the blood and the mental condition, but that it bore a relation to the physical disorder, debilitated conditions of the system, and general vitiation of the blood. In fact, the time had not come to determine the exact and significant facts which have but recently emerged from the chaotic state of opinion characteristic of pioneer work.

Thirty years elapsed before another systematic investigation of the blood of the insane was undertaken, when Dr. S. R. Macphail in 1884 won the medal of the Medico-Psychological Association. By that time the haemocytometer and the haemoglobinometer had been invented, and with these instruments of precision further advance was recorded. In general paralysis, Dr. Macphail found an increase in the relative proportion of white to red corpuscles, coincident with the progress of the disease: he failed to find any great difference in the proportion of white to red corpuscles in maniacal attacks, while in a series of recent admissions the proportion was increased. Most important is his conclusion, that there is a close connection between gain in weight, improvement in the quality of the blood and mental recovery.

Another prize essay on the same subject was the work of Dr. Johnson Smyth in 1890. He inferred that the relative proportions of white to red corpuscles were so variable as to be of little importance. In many instances, however, he recorded an excess of leucocytes, and stated that the blood of the insane is in a pathological condition.

Within the last few months Dr. L. C. Bruce has published his records of clinical investigations. Much of his book is concerned with observations on the blood of the insane, and specially on the leucocytoses which he has shown to be of definite importance in diagnosis and prognosis. What was dimly discerned by Dr. Lauder Lindsay half a century ago is made clear by Dr. Bruce to-day, and especially the important conclusion that the morbid state of the blood is a dominating factor in the evolution of mental diseases. Sufficient has been said to indicate the growth of medical opinion relevant to insanity as an affair of medicine.

Similar references might be made to other somatic conditions, the true nature of which are only now intelligible and explicable. I have referred to Schroeder van der Kolk as one of the first to appreciate the toxic nature of insanity.

The Hippocratic doctrine, that insanity is caused by disease, had been obliterated by the superstitions of the Middle Ages. Reil concluded that common sensation is the germinating soil of insanity, and disentangled it from Locke's narrow theory that insanity was nothing but a change in the working of the intellect Jacobi, by an extensive research, established the somatic conditions of mental disease, and finally overthrew Heinroth's doctrine of the common organ of Insanity and Sin—which, indeed, is not yet unknown in these latitudes. Griesinger and his school, however, in concentrating attention on the brain led to some neglect of the position attained by Van der Kolk, but again the tide turned towards an enlargement of that narrower doctrine. The brain, as the organ of mind, infinitely complex in its own proper connections, is at present the subject of study relative to its relations with all pathological somatic conditions. Thus, the sympathetic insanity of Van der Kolk is regarded as a toxic affection, not always and inevitably caused by the direct continuity of nervous elements, but rather by a poisoned blood supply; and the newer view is the wider. The contributory causes of insanity are to be sought in heredity, in defect and decay of organisation, in the disordered working of the somatic mechanism, and specially in the toxic elements which may be formed by that disordered mechanism, or introduced from without.

The trend of opinion in view of later experience is consonant with this toxic element in insanity, which again brings the manifestations of cerebral disorder into line with other pathological somatic conditions, and leaves the mystery of madness on a par with the mystery of rheumatism.

For the position is, that we have to deal with a constitutional disease, profoundly affecting metabolism, mainly originating in hereditary defect, and issuing in a liability to repeated attacks of insanity, of a cyclical nature, quite different from those maladies which, like smallpox, appear to confer a future immunity.

Dr. Ford Robertson from this place last year announced as a result of his researches on general paralysis, that the etiology of general paralysis and tabes is to be sought in the weakening of general and local defences, and that these diseases are dependent upon an active bacterial toxæmia. I need not repeat his argument for my purpose, which is to summarise broadly the present position in respect of all forms of insanity. It is sufficient to say that the work recorded illumines the ancient Hippocratic doctrine and translates vague guesses into a defensible system of opinion.

When Lister was as yet revolutionising the practice of surgery, and driving out the demon of sepsis from his wards, I had arrived

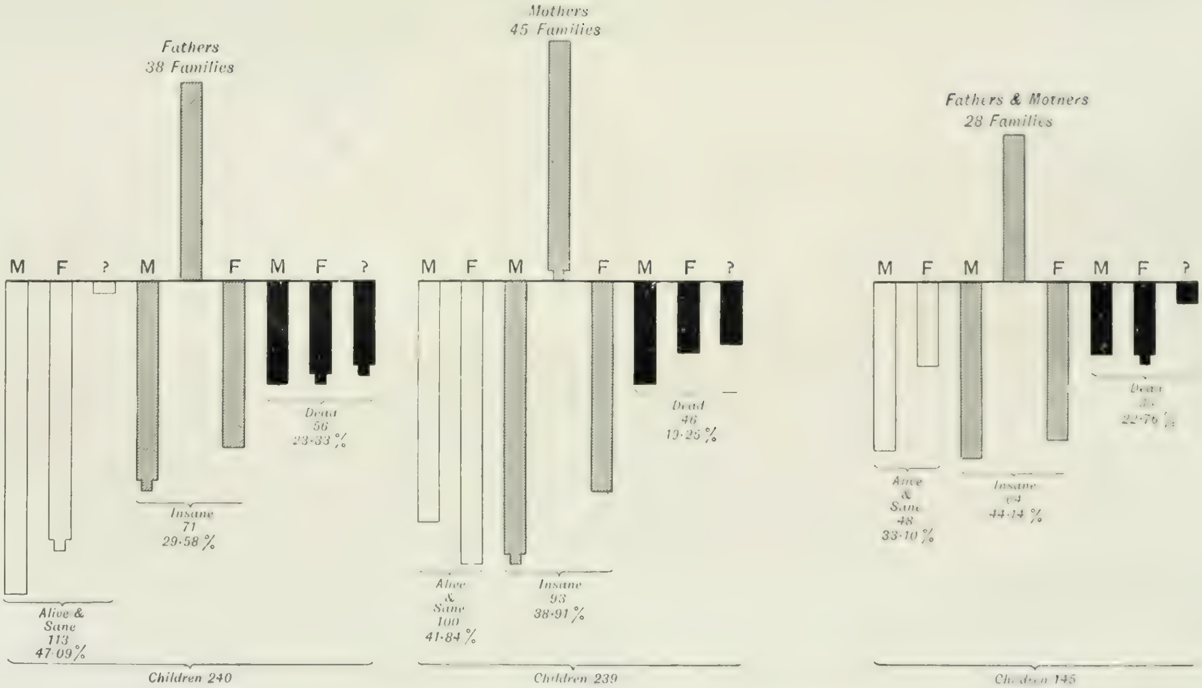

Chart of the Children of Parents Insane, Alcoholic, or otherwise Neuropathic.

at the conclusion that medical practice must adopt similar methods, and that asylum wards must be cleansed in accordance with the new ideal. It occurred to me that antiseptic treatment might alter the condition of the insane, and I made a long series of therapeutical observations on the internal use of carbolic acid, hyposulphite of soda, etc., which were too crude and ineffective to deserve recording. Newer drugs such as β-naphthol and eucalyptus proved more useful, and are still valuable in certain conditions of the alimentary tract; but bacteriology has so reformed our ideas, and so explained our difficulties, that we now gain a higher level of understanding, and have good reason to hope for a higher level of treatment.

From the medical point of view, mind is not a separate entity, nor can we think of mental disorders as entities. The mind, normal or abnormal, is but one or rather one series of vital manifestations, part and parcel of the individual. The brain is the organ of mind, but it is entirely dependant upon somatic agencies for nutrition, repair, rest, regeneration, and removal of noxious products—in short, for the normal manifestations of mind. These are elementary propositions, which are constantly overshadowed by prepossessions which hinder us, as the smoke of the conflagration obscures the origin of the fire. Sir John Bucknill's aphorism that a lunatic is lunatic to his finger-tips, gains an added force related to these considerations. The psychic disorder is generalised, the somatic disorder is generalised: both are constitutional. Very rarely is insanity a focal disease. Rather is it a generalised mental reduction, dependant upon generalised bodily conditions. It is always a mental reduction, characterised by a loss of the finer feelings, an inability to adapt, a loss of restraint on motor manifestations; and the depth and continuance of this reduction, the severity and pathological importance of the organic concomitants, are the measure of prognosis.

All insanity is defect—at least a degradation of function if not a degradation of structure. Politely, we speak of mental affections, just as acute mania is softened to hysteria, and idiocy to feeble-mindedness, but it is by the recognition of *defect* in the earliest stages of insanity that we may hope to recover lost ground.

If the defect of original constitution, the inherent instability of the neuropathic organism, is manifested in a perverted metabolism or a failure in the somatic defences against malignant bacteria, the aspect, the way of looking at insanity, is totally changed. Insanity is a unity, not a fortuitous collection of kaleidoscopic symptoms each requiring a proper name—M or N, as the case may be. I claim some honour in having so far spent my professional life without a single Greek synonym to my discredit. No doubt, it will always be convenient to speak of mania and melancholia and so on as convenient descriptions of common symptoms, but we may now hope to pass from these appearances to a more intimate understanding of the underlying facts.

I shall not impose upon the College a new definition of insanity, or a new classification. Definitions grow on every hedge, and sprout like mushrooms, for a day. For instance, Cullen's definition—"a lesion of the intellectual faculties without pyrexia and without coma"—will no longer stand the test of the clinical thermometer. If we provisionally adopt Dr. Hack Tuke's definition, a "disease of the brain affecting the integrity of the mind, whether marked by intellectual or emotional disorder," the content will be a vast variety of forms, the mere recital of the names of which would be intolerable. There is a strong temptation to confer a special designation on every symptom-complex which can be agglutinated; knowing so little of the pathological conditions, the symptoms of insanity have been erected into an undue importance, and classifications innumerable have been proposed, not one of which can be regarded as other than merely provisional. A distinguished architect evolved a leading principle in his work, which he repeatedly impressed upon me—*simplify your plans*; and I may be excused if I proceed no further than Griesinger in this matter of classification—broadly founding upon prominent symptoms, for it is still convenient to speak of states of depression, states of excitement, and states of enfeeblement—melancholia, mania, and dementia. Of course there is the familiar objection that melancholia and mania may alternate in the same patient.

Therefore in this broad view of insanity, these main features find a place; but it is also permissible to use the term circular insanity and delusional insanity, as denoting a pronounced mixed, alternating form, and a systematised, delusional condition, neither of which is distinctly mania, melancholia, or dementia. In fact, this simple classification is founded upon symptoms in terms of time.

It is evident, however, that as our knowledge progresses we are enabled to screen off from the total numbers of insane persons certain persons affected by definite pathological forms. *I shall therefore further divide the cases under review into cases of ordinary insanity of obscure causation and cases of definite pathological causation.*

Just here I stand at the parting of the ways: the beaten track has led us surely, if circuitously, to this position, where we discern the pioneers at work clearing the jungle of doubts and difficulties. It has long been evident that general paralysis of the insane constitutes a distinct pathological disease. The march of the symptoms, the pathological conclusions, are determined and evident. It is a gross organic disease of the brain. The evidence for a similar conclusion regarding epilepsy has also accumulated. And of course the senile degenerations of cerebral tissues are admitted. The crude toxic action of alcoholism on the intimate structures of the brain is so far determined as to permit of this also being regarded as truly pathological. I shall also add traumata, whether insolation or violence; for Van Gieson has shown that the effects of these injuries are microscopically identical. There remain cases of idiocy,—brains arrested in development, or pathologically and irretrievably damaged.

Therefore, on the one hand, while I regard the pathological forms as of little moment in respect of prognosis under present conditions, as fixed, irrecoverable, and already doomed; on the other hand, I regard ordinary insanity as uncertain, curable, and now even hopeful. It may be that general paralysis is to be lifted out of the category of reproach, that it will be fought and conquered, as has been suggested by Dr. Ford Robertson. But the difficulties are, to my mind, almost insuperable; and I do not contemplate a general vaccination to obviate the rare event. At any rate these observations are directed to the results of experience rather than the possibilities of the future. And yet it is to the future we must look for relaxation of the bonds now imposed upon us.

I propose nothing new in thus considering cases of insanity. Indeed, it is only a year ago that Dr. Graham Crookshank revived the memory of Dr. W. H. O. Sankey's brilliant generalisation—"that insanity is but the process, and that the so-called varieties are merely differentiated by non-essential phenomena; that all insanities begin with melancholia, and tend to pass through a succession of stages in the order, melancholia, mania, and dementia, a succession liable at any time to interruption by recovery." It is forty years since Sankey first published these shrewd conclusions, and emphasised the importance of the initial stage of melancholia or depression, so commonly observed and yet so little regarded. No doubt, in his plea for simplification, Sankey was carried a little too far, for it is not in every case in accordance with clinical experience. The facts of the initial stage of insanity are very obscure: they are overlooked, they are forgotten, they are minimised. Yet it is by these facts that the true somatic nature of these maladies are determined, and in the instant appreciation of them that we are to find a new and more excellent treatment.

I have said that I stand at the parting of the ways towards which Sankey's generalisation led, and at which the track becomes clearer. Dr. L. C. Bruce has lately shown, by the published account of his clinical studies, that, disregarding the mental concomitants, there is evidence of the toxic nature of insanity. This evidence is of such a nature as to be appreciable by the methods of the clinic and the laboratory, to be checked or corroborated by other observers. It is not a theory of disease, but the direct outcome of a long, laborious, and skilful investigation into the facts of disease—honest and unprejudiced. I cannot refrain from congratulating a Fellow of the College, and my near neighbour, upon the distinguished position he has won. His work opens up new vistas, and affords new hopes. He has, finally, brought insanity into the category of other somatic diseases, and established a parallel condition, long surmised and discovered with difficulty, long obscured, and at length distinguished by none other than the method of Zadig.

Briefly, it would appear that the time has already come when the conclusions formulated by Dr. Ford Robertson last year in reference to general paralysis, the failure of the organism to protect itself against bacterial invasion, may be extended to forms of ordinary insanity, which hitherto have evaded the skill of the pathologist. Whether it is consequent on a metabolic toxæmia, or on a bacterial invasion, insanity must now be regarded as a condition of disease which demands no special pathology, and therefore no exceptional treatment.

To resume, it is necessary to revise the opinions of yesterday, to recognise that a neuropathic heredity is operative in the weakening of the somatic functions and defences at an earlier or later period of the individual existence; that the physical conditions are the important considerations which now more than ever render insanity an affair of medicine, and finally justify the founder of the Morison Lectures in the encouragement which he gave to these studies.

STATISTICS.—The statistics of insanity present grave difficulties and pitfalls innumerable. They are the most elusive of vital statistics. Asylum statistics are notoriously untrustworthy, and impossible in collation. There is no personal acquiescence in underlying principles, and recent proposals in this direction tend to make confusion worse confounded. There is, for instance, apparently no possibility of general agreement as to the use of the word "recovery," by which I mean to indicate those in whom there is re-establishment of mental soundness, permitting of return to ordinary life, without need of the care and the supervision of others. Recovery may be used to designate a partial improvement in mental condition, a lucid interval more or less temporary, or a discharge from asylum care and control to the custodial care of home life. A final, permanent recovery, we shall see, is a comparatively rare event, just as rare as a true recovery from gout. The recoveries generally claimed in asylum statistics are referable to *cases*, not to *persons*. Even when referable to persons they are only declared, and that rarely, as recoveries so far as official statistics can show. No doubt, the same remarks may be made regarding the medical results of general hospitals dealing with other constitutional diseases of obscure causation. The persons are received and treated, are discharged cured, and return relapsed. The vital history can only be completed on death.

Again, the stock question put to an asylum physician is, *Do* *you believe that insanity is increasing!* It is, of course, a question of urgent national importance, and therefore has to serve the purposes of the journalist and the pamphleteer, who gain a more or less honourable livelihood by their writings around the social conundrums of the day. It probably pays best to use a large brush, and to begin with the word "alarming." It is also an opportunity for the member of Parliament with a question to ask. The Commissioners of Lunacy of the three kingdoms have done their best to inform and reassure, but the staid and guarded results of their investigations are not effective in ending the discussion. Besides, it is easier to ask a crisp question than to study voluminous blue-books. Imagine the popular outcry if the unrecovered persons discharged from general hospitals had to be kept for life in these institutions, and the resulting dread of *national degeneration*!

I cannot regard it as possible to answer the question until to each insane person recorded in the registers of the Commissioners has been assigned one number, and no more; and until the asylums of the country use these individual numbers in any statistical returns they may make for collective investigation. The crime of the country, the criminal offences committed, is a question apart from the number of persons committing these crimes. A system of law which has regard to the crimes rather than the criminals, is defective and uninformed; and a system of medicine which is occupied with diseases rather than diseased persons stands condemned by its own ineptitude.

No doubt, the physician may take credit for cure, the return of his patient to the ordinary activities of life—always under the full understanding, *je le pansay, Dieu le guerist*; but if we are to see life sanely and see it whole, we can call no man happy until he is dead. Even in this last event suspicion may lurk.

Obs. 1773.—Female, unmarried, æt. 50, admitted in 1879, labouring under delusional insanity of an apparently intractable type. Hereditarily strongly predisposed to mental disorder, she exhibited the usual features of climacteric insanity of persecution. She was, as the French say, a persecuted persecutor, and so remained for eight years, when she made a good recovery, and returned to her usual life of social and charitable interests. Seventeen years after her recovery, at the age of 75, she returned to asylum care, a typical case of senile melancholia. In the course of a year or so, recovery was again recorded. But for survival to the age stated, she would have been regarded as a final and satisfactory recovery. No doubt, the case is somewhat exceptional—firstly, in regard to the delayed recovery from a delusional condition, apparently fixed; and, secondly, as a relapse into insanity of a different type at an advanced age. A recurrent case is generally more steadfast in symptoms, which, almost always, are reproduced in unvarying succession in succeeding attacks.

It is therefore very difficult to attain such a degree of exactitude as is desirable, and the methods of applied mathematics are placed at a disadvantage in dealing with these problems. Further, the number of observations at my disposal are so small, that any deductions must be made with reserve. The element of error, of course, increases as numbers diminish. On the other hand, the studies on which these conclusions are based have an advantage of more intimate and revised personal knowledge than those drawn from wider sources. After dealing with patients belonging to the middle class of Scottish society, throughout a long residence in the county of Perth, it appears appropriate to give some account of that experience as a retrospect.

In 1905, in the Presidential Address to the Section of Psychological Medicine at the British Medical Association Meeting in Leicester, I laid before the Section the results of studies in heredity, and then expressed the hope that I should be able to follow out the histories of these cases, as successes or failures. This occasion seemed suitable, and I therefore returned to the cases reported upon at Leicester, and have reproduced certain tables[1] made for that purpose. The cases submitted are those under my care during twenty-five years, from 1880 till 1904 inclusive, and include those resident in Murray's Royal Asylum at the beginning of 1880.

I have omitted voluntary patients, with some reluctance. The hereditary and other causal factors are so similar, and the facts are so much in accordance with those observed in the certified class, that they might well have been treated as a whole. There is a similar tendency to relapse, and the broad results generally resemble those of the certified class, especially of late; for year by year the number of voluntary patients increases, certain patients who formerly would have been certified preferring the less formidable arrangement. The somatic complications, too, are practically the same. When I gave evidence before a Departmental Committee, and entered upon a consideration of these somatic conditions, Sir Charles Cameron, the chairman, remarked, "You must have got hold of a particularly diseased lot." That is the position I still maintain,—those suffering from insanity are particularly diseased; and if all the apparatus of our hospitals for the insane is not bent to the elucidation and treatment of bodily disease, they are *pro tanto* medical failures, obvious and indefensible.

On the other hand, the introduction of voluntary patients would have raised questions as to the relative or comparative value of these conclusions, since it is usual to exclude them from the annual statistics of asylums.

I therefore find, as formerly, that the numbers under consideration are 419 men and 390 women, being a total of 809 persons. For the reasons I have already indicated, the readmissions are excluded. They are the same persons returned to us for one reason or another. They may have relapsed, or their reappearance may be due to other causes such as temporary absence in other asylums for medical or social reasons. The record of readmissions is generally purely official and of slight scientific importance.

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[1] The series of tables will be published in the *Journal of Mental Science.*

It is true that, of late, attempts have been made to bring transfers from one asylum to another, and readmissions into scientific categories. No doubt it is important to discriminate between the various official classes for official purposes, but these purposes are not relative to medical science. We are concerned with the conditions on first attack, on recurrence of attack, and not with the mere accidents of placement. The number of readmissions into asylums bears but an indefinite relation to occurring insanity, and is no true indication of the tendency to relapse. Nor are the first admissions an indication of first attacks. Meanwhile, it is sufficient to state that 195 persons out of 809 were relapsed cases before their first admission into the Perth Royal Asylum, and I have no doubt that careful investigation would establish a similar result elsewhere.

I therefore desire to concentrate attention on 809 persons, and not on 982 cases.

Any study of insanity must begin with a consideration of heredity—the earliest conditions affecting the organism. We have to determine the effects of heredity, in so far as possible, in elucidating questions of prognosis. Is heredity effective in one direction or another in relation to recovery, relapse, incurability, and expectation of life?

The percentage of those with a hereditary history of insanity may be stated as 45, while the inclusion of the whole neuropathic heredity increases that number to 72. It is a narrow view of the heredity of insanity which does not include the occurrence of the graver neuroses, want of mental balance, eccentricity, alcoholism, and paralysis. These manifestations in one generation so frequently issue in pronounced insanity in the succeeding generation, that the nature of the incidence is obvious.

It has been objected that paralysis is not necessarily a disease involving mental aberration, but that must be relative to the exact situation of the morbid process, and what is exactly meant by insanity. Nothing is more common in the practice of the physician than to find a certain mental degradation in cases of cerebral paralysis, but of course it is a relatively small proportion who require the care and control of an asylum. I believe that these objections are largely due to the limitations of the official mind, to which I have already referred. At any rate, when one finds records of 191 cases of paralysis among the near relatives of 623 insane persons, it is evident that the facts cannot be explained away as merely accidental.

There is an important class of insane patients who become insane consequent upon arterio-sclerosis, or other degenerative changes in the blood vessels of the brain, cases in which the cerebral circulation, nutrition, and function are deeply affected, and issue in a group of symptoms recognisable as a whole.

We have to deal with a condition which has certain hereditary relations, owing to a defect of organisation, and comparable with arterio-sclerosis, gout, or other diseases of obscure causation. It is not the crude heredity of yesterday, but a failure in development, or metabolism, or a weakening of somatic defences, apparent in early life, in the period of development, in the stress of maturity, or in the decay of old age. And the more marked the parental defect, the earlier will be the failure of the new organism, exactly in conformity with the vital statistics of gout.

We are so accustomed to think of somatic stigmata and congenital idiocy as inborn defects, that it is easy to misinterpret the true nature of these failures. So far as I can see, the defect is of the same intrinsic nature, whether the mental disorder be manifested in early idiocy or delayed until senility. There is no adequate reason to deny the existence of prenatal toxins, assuming that toxins are effective in the production of cerebral disturbance and later insanity. By the hereditary nature of insanity, I therefore mean the inborn defect which is manifested under certain conditions in the existence of the organism. Not, crudely, that fatuous and furious persons are so conceived, but that their defect of organisation is such as renders them liable to fatuous or furious manifestations throughout the course of their existence, when subjected to certain morbid influences.

Dr. John Macpherson lately declared before the Royal Commission on the Care and Control of the Feeble-minded, that "feeble-mindedness is a variation which tends to propagate itself; and further, that it is useless to attempt to extirpate it by cutting short the existing obviously defective families." Dr. Macpherson has so recently addressed the College on this subject that I need not recapitulate what is already well known. The point for me is, that heredity works out in two directions—for better or worse. We hear so much of the latter, that the former is neglected or but partially recognised. The nimble rectifier of social diseases is always ready with worse remedies.

I look back upon the time of my University education—how small a part of professional life—as a time when scepticism was insistent and rebellious. I learnt to write prescriptions in the grand manner for examination purposes, but with mental reservations always. *Vis medicatrix naturæ* was the still small voice which influenced many of us, and which still, with a wider, a more scientific, and a more capable method, dominates my medical intentions. Glib talk about the extinction of families and the eradication of undesirables, must be balanced by the reasoned knowledge of natural processes. On the one hand, we can discern the ruin and decay of families, in spite of the constant effort of nature at reconstruction and rehabilitation; on the other hand, by the prepotency of new blood and a more favourable environment, there is a reversal of the process—a rehabilitation just as important and just as certain. Of course this cannot be demonstrated by the statistics of asylums, and the official mind, "subdued to what it works in," is obsessed by the calamities and the degradation of human nature. I daresay that the physician in daily and intimate contact with general diseases suffers the same disadvantage, for it seems to me that there are those who have finally concluded that the world was made for doctors, and that disease is inclusive in the natural order of things, constituting the best of all possible worlds.

Let us consider this question of *Regeneration* at its worst. Plate IV. shows the families of neuropathic parents as derived from asylum statistics. It illustrates, by the way, the necessity for immediate reform in our method of recording insane individuals only. It further illustrates the true incidence of heredity at the time of observation, and is so designed. Thirty-eight neuropathic fathers had 240 children: 47 per cent. were sane, 29 per cent. were insane. Forty-five neuropathic mothers had 239 children: 42 per cent. were sane, and 39 per cent. were insane. I have also recorded those most heavily burdened—the double heredity shown in the families of twenty-eight neuropathic fathers and mothers—145 children, of whom 33 per cent. were sane, and 44 per cent. were insane. Even in this disastrous class, the efforts of nature towards regeneration are obvious. The race tends, as Dr. Macpherson showed, to maintain average characteristics; but, as Professor Karl Pearson has indicated more recently, there is probably an intensity of correlation between want of mental balance in parents and offspring from about 0·25 to 0·30—similar to the correlation between parents and children in regard to other and directly physical characters (stature, colour of eyes, etc.). It is just here that our statistical information generally fails, for the records of special hospitals must be replaced by the statistics of the general population taken at random; and I deeply regret that work of this importance is left to a few enthusiasts, instead of being undertaken by the medical profession as a whole, in furtherance of biological and sociological knowledge. This method of research does not apply merely to insanity, but to all those constitutional disorders, to all those departures from the normal, which are of the greatest national importance. Until a collective investigation of the kind is completed and analysed, it is vain to attempt any final prognostic in heredity. If vital histories of families, with medical details of their normal and abnormal members, could be extracted from clinical records and reluctant memories, to the number of some thousands, the inchoate condition of our opinions in reference to heredity would be reduced to order and some degree of precision.

It has been my practice, so far as possible, to construct graphic charts of each family under observation; and these have been submitted to Mr. David Heron, whose important study of the "Relation of Fertility in Man to Social Status" gained a wide and appreciative audience last year. . . .

It would appear that the incidence bears heaviest upon the eldest members of the families in fraternity, and that there is a fairly constant diminution of frequency as the families increase in size. I am not aware that this calculation has been made previously; in fact, the methods of applied mathematics, and the working out of problems of probabilities in relation to biology, are as yet in an early stage of development. The important biometric system advocated and instituted by Professor Karl Pearson will greatly enlarge our knowledge and correct our prepossessions, if the desirable data are forthcoming. We only require a collection of accurate facts in sufficient numbers to reduce the margin of error.

(*To be continued.*)

THE NATURE OF THE OVARIAN INFLUENCE UPON THE UTERUS, AS ILLUSTRATED BY THE EFFECTS OF EXCISION AND GRAFTING OF OVARIES.[1]

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It is well known that double ovariotomy when performed prior to puberty exercises a prejudicial effect, not only upon the generative organs, but also upon the whole organism. There is, however, some disagreement as to the results of this operation when performed after puberty, and particularly in regard to the occurrence of heat or menstruation.

It is the purpose of this paper to adduce further evidence upon this question, as well as to describe experiments the result of which indicate that the nature of the ovarian influence is chemical rather than nervous.

Numerous instances have been cited of the occurrence of menstruation after double ovariotomy. Thus three cases have been recently described by Doran (1905), in each of which the ovaries were believed to have been removed, and the greater part of the uterus was also removed, but where menstruation occurred at irregular intervals after the operation.[1] Doran, however, records a large series of other cases in which menstruation ceased after ovariotomy. In a further case described by Pozzi, the recurrence of the catamenia after removal of the ovaries is thought to have been due to the presence of a uterine fibroma, but Pozzi makes no suggestion as to why such a fibroma should have the effect supposed. A case of greater interest has lately been recorded by Pinard, in which ovariotomy was performed for mollities during pregnancy. After delivery, the catamenia returned, and also the bad symptoms. Hysterectomy was then performed, and on inspection ovarian tissue was detected in the position from which the ovaries had been removed. It would seem probable that the other cases of menstruation taking place after double ovariotomy are to be similarly explained, on the assumption that the removal was not quite complete, and that the ovarian tissue which remained underwent hypertrophy. That this interpretation is correct is rendered the more probable in view of the cases referred to by Doran (1902), in which pregnancy occurred after the supposed removal of both ovaries. Since the publication of Doran's paper, in which the literature is given, a further case of pregnancy after double ovariotomy has been put on record by Meredith (1904).

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[1] The substance of this paper was communicated to the Royal Society of Edinburgh in December 1906, and is here reproduced with some alteration and abridgment.

It is a not uncommon practice among veterinarians to remove the ovaries of dogs in order to prevent them from breeding. We understand from Principal M'Call of Glasgow that normal heat does not occur in dogs on whom this operation has been performed.

Ovariotomy is also sometimes performed on mares, and usually with the object of repressing those vicious symptoms which so often occur during the œstrous periods, and render the animals at such times almost or quite unworkable. Details of fifty consecutive cases of ovariotomy in troublesome mares are given in two papers by Hobday (1902, 1906), who shows that the operation is frequently followed by perfectly successful results. From these papers it does not appear certain that œstrus is completely prevented after the removal of the ovaries, but the violent symptoms which rendered the mares useless for work were in nearly every instance suppressed. In one case ovariotomy was undertaken to prevent œstrus, and the result was regarded as having been "satisfactory." Other mares are described as having been operated on because they were "always in œstrum" and so presumably unworkable, and in these cases also the result of the ovariotomy is said to have been satisfactory.

The statements of certain writers regarding the condition of the uterus subsequent to double ovariotomy are in opposition to the views of those who hold that heat and menstruation may occur after the performance of that operation. Thus Knauer (1900) says that removal of the ovaries in rabbits brings about a premature menopause, the uterus undergoing atrophy. Similar statements have been made by Sokoloff (1896), Hofmeier, Benkiser (1891), and Buys and Vandervelte (1894). Hofmeier and Benkiser, however, ascribe the degenerative changes in the generative organs after ovariotomy to an insufficiency in the blood supply consequent upon the operation of removal, while Buys and Vandervelte are disposed to regard these changes as being the indirect result of an assumed severance of nerves passing to the uterus and vagina. Limon (1904), on the other hand, states that he found no sign of atrophy in the generative organs after the transplantation of the ovaries to an abnormal position, and therefore that the respective explanations offered by Hofmeier and Benkiser, and by Buys and Vandervelte, are inadequate. But Limon does not appear to have made more than a superficial examination of the organs to which he refers. He mentions also that the experiments of Knauer, Ribbert, and Rubinstein point to the same conclusion as his own, and support the view that the proper nutrition of the uterus is dependent upon the existence of an internal ovarian secretion.

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[1] Bell (1906), referring to such cases in a recent paper, is disposed to ascribe the continuance of menstruation to the presence of the uterus, which he regards as sufficient for the purpose even in the complete absence of the ovary.

Our own observations on this matter are such as seem to us definitely to exclude the possibility of the recurrence of normal heat after the ovaries have been removed for a period longer than a few months.

The blood supply of the uterus is derived largely from the uterine artery which is given off in the pelvis, and is in no way interfered with by the operation of ovariotomy. The ovarian artery in the experiments described below was necessarily severed at a point a little short of its entrance to the ovaries, and in all our experiments the blood supply of the uterus may be said to have been unimpaired.

EFFECTS OF CASTRATION.—With the object of observing what changes, if any, are brought about in the uterus by the removal of the ovaries, we have performed ovariotomy in thirty-three rats. Both ovaries were removed by an anterior median incision. The rats were killed at periods varying from two and a half to eight months after the operation, and the uterus examined histologically. In the great majority of cases the uterus has been found to exhibit divergence from the normal in a greater or less degree. It is small and atrophied. The mucosa is thin and poor in cells, the mucosal glands are small, while the connective tissue is increased in amount. In some cases the histological changes are very marked. The muscular wall tends to become thinned and its connective tissue increased. The mucous membrane is not infrequently altered to a condition of great fibrous overgrowth, the glands becoming hardly recognisable.

In several cases the uterus was found to have become distended with clear fluid, and on microscopical examination the uterine wall was seen to be thinned, the mucosa being represented only by a few cells and some fibrous tissue, and the lining epithelium converted into a stratified squamous epithelium.

In more than one instance an appearance resembling endometritis was observed after castration, the mucosa being swollen and the epithelium desquamated. There was in these cases no inflammation at the site of operation nor obvious source of septic infection, and the condition may probably be interpreted as a degenerative one.

In one case, where no atrophic appearances were presented by the uterus, a small portion of one ovary in which at least two corpora lutea had become developed, was found on post-mortem examination to have been left behind at the operation.

The effect produced upon the uterus by removing the ovaries and transplanting them to abnormal positions will be discussed after we have described our experiments on ovarian transplantation.

OVARIAN TRANSPLANTATION.—The grafting of various organs of the body (such as the thyroid, suprarenal, kidney, etc.) in abnormal positions in the same individual, or in normal or abnormal positions in other individuals, has been attempted by numerous investigators, with a varying amount of success. As a general rule, heteroplastic transplantation (*i.e.* from one individual to another) has been found more difficult to carry out than homoplastic transplantation (*i.e.* in the same individual), while the latter in the case of many organs has not so far been successfully accomplished.

Transplantation of the testis has been attempted by Ribbert (1898), but without success, the grafted organ undergoing a rapid degeneration. Shattock and Seligmann (1904), however, state that in attempting to remove the testes of fowls the organs in some cases broke up, minute fragments being left behind and becoming attached to the adjacent viscera or abdominal wall, continued to produce spermatozoa and act as functional glands. In these cases it would appear that transplantation was unintentionally effected.

Ovarian transplantation has been practised or attempted by various gynaecologists, surgeons, and others. The grafts in some instances are stated to have been successful, but histological descriptions of the transplanted ovaries are usually either very inadequate or altogether omitted.

The cases described by Morris (1895), Dudley (1897), and Glass (1899), in which ovaries were grafted into women whose own ovaries had been previously removed, have been mentioned in our previous paper (1905). It should be noted, however, that no record has been made (at least so far as we are aware) of the further history of these cases since they were first published, and although they have been described as successful, in the absence of post-mortem examination there is no direct evidence that this was the case.

The case recently described by Morris (1906), in which a woman with a grafted ovary (her own ovaries having been extirpated) is said to have become pregnant and given birth to a child about four years after the operation, is still more problematical. A possible explanation of this case is that a portion of one of the woman's own ovaries had been accidentally left behind at the time of the operation of removal, and had subsequently undergone hypertrophy, and given rise to the ovum which afterwards became fertilised, just as in the cases described by Doran referred to above. If this be the true explanation, there is no need to assume that the transplanted ovary had become functional. Morris states that the woman did not menstruate until four months after the transplantation had been effected, and then menstruated at irregular periods. There is no post-mortem evidence that the graft had been successfully attached.

Cramer of Bonn (1906) has recently recorded a case in which the ovary of a woman suffering from osteomalacia was removed and transplanted into a second woman whose genital organs were much atrophied. The operations were performed simultaneously. As a result of the transplantation, the genital organs of the woman in whom the ovary was grafted are said to have become normal, menstruation started once more, and the breasts secreted colostrum. The author regards this case as affording further evidence that transplanted ovaries can maintain their functions.

The earliest attempt to transplant ovaries in animals seems to have been that of Romanes, who refers to them in "Darwin and after Darwin," vol. ii. (1895). These experiments were unsuccessful.

Knauer (1896) removed an ovary from a rabbit and transplanted it upon the corresponding uterine horn in the same individual. After several months he killed the rabbit, when he found the grafted ovary, which contained Graafian follicles, some degenerate, but some apparently healthy.

Grigorieff (1897) performed a series of experiments in which he transplanted ovaries of adult rabbits to the broad ligament or the peritoneum of the vesico-uterine pouch. Subsequently he found that the grafts had become successfully attached, and contained follicles in a state of complete preservation. In four cases pregnancy is stated to have occurred, the ova being supposed to have been derived from the grafted ovaries.

Grigorieff also mentions two cases in which ovaries were transplanted from one individual to another (heteroplastic grafting). Both of these are said to have been successful, but no description is given of the transplanted ovaries.

Arendt (1898), who attempted to transplant the ovaries of eleven rabbits to the broad ligament, was unsuccessful in all cases. This author criticises the results obtained by Knauer and Grigorieff, and concludes that in the cases of pregnancy described by the latter the ova were produced in fragments of untransplanted ovarian tissue which had been left in the normal position.

Arendt expresses doubts as to the possibility of successfully transplanting ovaries.

Ribbert (1898), working on the guinea-pig, obtained results in homoplastic transplantation, which in a general way are confirmatory of those of Knauer and Grigorieff. During the first month after transplantation the peripheral part of the grafted ovaries remained unaltered, but the central part became transformed into connective tissue. At later periods, however, the central portion of the ovaries was again found to contain follicles. Ribbert attributes this fact to the conditions of better nutrition which the ovaries had probably attained after a month of transplantation.

Rubinstein (1898) was also successful in transplanting rabbits' ovaries to abnormal positions in the same individuals.

Knauer in a later paper (1899) has described certain further experiments in transplanting ovaries. These were to a great extent successful. Knauer, however, states that a portion of the grafted ovary invariably died, but the remaining part in a large percentage of cases contained healthy follicles. Thirteen further cases are mentioned in which an attempt was made to transplant ovaries from one individual into another (heteroplastic transplantation), but each of these is reported as having been unsuccessful.

McCone (1899) in a preliminary report briefly describes two cases of heteroplastic grafting. In one of these the ovaries of a rabbit were implanted in another rabbit (previously castrated), and the latter is stated to have subsequently given birth to five young. In a second experiment, the ovaries of a bitch are described as having been successfully grafted upon a rabbit. Other experiments are mentioned in which homoplastic transplantation (*i.e.* transplantation in the same individual) of rabbits' ovaries is said to have been effected. The accounts are very meagre, and do not appear to have been followed by a full report. This is the more to be regretted, since other experiments of a similar nature are mentioned as having been in progress. In the absence of a full report stating the results of the entire series of experiments and entering into histological detail, we hesitate to express ourselves regarding the value of McCone's work.

Herlitzka (1900) has described forty experiments in which he tried to graft the ovaries of guinea-pigs upon the bodies of other individuals, some female and some male. The experiments were unsuccessful in all cases except one, the ovaries undergoing a process of degeneration with greater or less rapidity. The single exception was the case of an ovary which after transplantation for forty-two days was found to contain follicles with an apparently normal ovum. The ovary contained other follicles which were degenerate. In this experiment the ovary had been transplanted to the body of a female. Herlitzka describes those cases in which the ovaries are transplanted to new positions in the same individuals as homoplastic transplantations, while the cases in which they are implanted on other individuals he denotes as heteroplastic transplantations. We have adopted this terminology in the present paper.

Schultz (1900) has given an account of five experiments in which the ovaries of guinea-pigs were grafted upon the bodies of males. All the five experiments are said to have been successful. Schultz's results have been criticised somewhat severely in a further paper by Herlitzka (1900), who complains of insufficiency of detail in the descriptions of the experiments.

Foà (1900) has described a series of experiments in which the ovaries of newly born or very young rabbits were grafted in the normal position in older rabbits of various ages whose own ovaries had been removed. Some of the grafts are said to have "taken" successfully, and even to have undergone growth after transplantation. In five other experiments the young ovaries were grafted without first removing the ovaries of the animals upon which the grafts were made, and of these three are said to have "yielded a positive result," but no description of the grafts is given. In other cases in which embryo ovaries were grafted in old rabbits which had reached the menopause, the grafts degenerated very rapidly and were absorbed without leaving any trace.

Amico-Roxas (1901) has briefly described heteroplastic and homoplastic transplantation of sheep's ovaries, but without giving any account of the histological structure of the transplanted ovaries.

Morris (1903), whose cases of ovarian transplantation in the human female have already been referred to, has also mentioned that he carried out some experiments on heteroplastic transplantation in rabbits. He states that the grafted ovaries continued to furnish ova and to elaborate an internal secretion for some months, but that they then underwent degeneration. He does not, however, give any account of his experiments, and omits to state the evidence upon which he bases his conclusions that the transplanted ovaries continued to provide an internal secretion.

Limon (1904) performed four heteroplastic transplantations of rabbits' ovaries which were grafted on the peritoneum or between the muscles of the abdominal wall. The follicles all showed a tendency to degenerate, but the interstitial cells, on the other hand, after a short period of starvation subsequently recuperated and acquired a condition of perfect vitality. There is, however, no mention of the Graafian follicles having done likewise, or of corpora lutea having been formed.

Basso (1905) has performed both homo- and hetero-plastic grafts in rabbits and guinea-pigs. The ovaries were usually grafted on the mesometrium. Some success was attained, but in the heteroplastic implantation the ovarian stroma is described as having become necrotic.

Bond (1906), in a recent paper on "Some Points on Uterine and Ovarian Physiology and Pathology in Rabbits," has referred to a few experiments in which he transplanted ovaries to abnormal positions in the same individuals (homoplastic grafts). Only one experiment appears to have been at all successful. In this case a somewhat modified and degenerate "corpus luteum of pregnancy" was found after the ovary had been grafted for about a month in a pregnant animal whose other ovary had been allowed to remain *in situ.*

Our transplantation experiments have been performed on rats.

I. *Homoplastic Implantation.*—The ovaries of nineteen rats were excised and transplanted to another situation within the peritoneal cavity, being attached by means of a catgut stitch to the parietal peritoneum. Of these cases the following eight may be described as entirely successful:—

1. The grafted ovaries were allowed to remain for two and a quarter months. When examined they were found to contain follicles and ova. The follicular epithelium was normal, and groups of interstitial cells were visible in the stroma. The germinal epithelium had disappeared from the outside of the ovary. Several large cysts lined with squamous epithelium were also present. The ovaries were examined in the month of January, *i.e.* before the breeding season of the rat.
2. The graft was here left for two months, and the rat was killed in the beginning of the breeding season. The graft contains follicles and a large number of corpora lutea of apparently different ages.
3. This graft was left for two months, and showed on microscopic examination follicles, ova, and corpora lutea. The rat was killed during the breeding season.
4. The graft was left for two and a half months, and exhibited follicles, corpora lutea, and a cyst. Killed during breeding season.
5. Graft left for three months. Normal corpora lutea and cysts were found present. Killed during breeding season.
6. Graft left for eight months. A few corpora lutea and follicles were present with relatively large amount of stroma. This rat was killed in October, *i.e.* during the non-breeding season.
7. Graft left for five months. The ovarian stroma was unaltered. Some luteal tissue, follicles, and cysts were also present.
8. Graft left for six months. Shows follicles and corpora lutea.

In seven other cases of homoplastic implantation partial success was obtained. The tissue was recognisably ovarian, but had become considerably altered.

Five experiments must be described as unsuccessful, the grafted tissue either being entirely absorbed or replaced by connective tissue. Cysts were found present in each of these cases.

II. *Heteroplastic Implantation.*—Six operations were performed in which ovaries were removed from one rat and implanted on the peritoneum of another.

Two cases were attended with success:

1. The ovaries were removed from a rat and transplanted to the peritoneum of another whose own ovaries had previously been removed. The graft was left for three and a half months, when the animal was killed. Examined microscopically, the graft showed ovarian stroma and corpora lutea. The two rats were possibly of the same litter, but this was not certainly known.

2. The ovaries were removed from a rat and transplanted to the peritoneum of another whose own ovaries were not removed. The two rats were of the same litter. The graft was left for one and a half months. It contained follicles and ova. The stroma had become degenerate in places.

Four other similar experiments, while not entirely satisfactory, met with some success. In one of these the ovaries were transplanted to a male rat. The graft showed recognisable ovarian tissue in parts, but had undergone very considerable degeneration.

A number of experiments were also performed in which ovaries from one rat were grafted under the skin on the anterior abdominal wall of another rat. In three such cases some success was obtained, but a larger number of grafts was absorbed than when the implantation was intraperitoneal.

It will be observed from the foregoing account of our experiments, that it is possible to excise and graft ovaries in such a way that in many cases the grafts exhibit all the characteristic histological features of ovarian tissue. The germinal epithelium had, however, always become absorbed. In other cases a certain amount of degenerative change took place, only certain elements of the tissue being recognisable after the lapse of several months; thus the stroma might present its normal appearance while the follicles had disappeared, or the greater part of the graft might be composed of luteal tissue alone.

It will further be seen that the cases of transplantation classed as successful are fewer in heteroplastic than in homoplastic implantation. Of our two successful heteroplasts one was a graft into a rat of the same litter, while the other was possibly, but not certainly, a similar case.

The maintenance of the histological characters in successful grafts points to retention by them of function, and further evidence of their functional integrity is derived from the fact that the constituents of the graft varied according to the period in the reproductive cycle at which the animal was killed. At the commencement of the breeding season large follicles were found in the graft. At a later period corpora lutea were present. It is to be presumed, therefore, that the grafts passed through the same phases of functional activity as normal ovaries.

CONDITION OF UTERUS AFTER OVARIAN TRANSPLANTATION.—We examined the histological condition of the uterus in those cases where the ovaries had been removed and transplanted to another position in the body. The appearance of the uterus was found to bear a relation to the microscopic structure of the graft. If the latter had retained unaltered, or with little alteration, the typical characters of ovarian tissue, the uterus was found undegenerated. If, however, the graft had failed to "take," the uterus exhibited undoubted signs of degeneration. Where the graft had been successful, on examining it and the uterus post-mortem, we found that each organ had, as a rule, the appearances appropriate to the time of year and stage of the reproductive cycle at which the animal was killed.

In the case of transplantation from rat to rat, uterine degeneration was found, as in homoplastic implantation, to be arrested by a successful graft.

GENERAL CONCLUSIONS.—In a previous paper,[1] we supplied evidence in support of the view that heat and menstruation are induced, either directly or indirectly, through the activity of an internal secretion or hormone arising in the ovaries, while we adduced further evidence that the corpus luteum provides a secretion which assists in the nourishment of the embryo during the first stages of pregnancy. In the present paper we show that the existence of ovarian tissue is an essential factor in normal uterine nutrition, and further, that the nature of the ovarian influence upon the uterus is chemical rather than nervous, since the successfully transplanted ovaries, while still maintaining their functions, had lost their normal nervous connections. It is extremely probable, therefore, that the uterus is dependent for its proper nutrition upon substances secreted by the ovaries, not merely at the heat periods and during pregnancy, when they show their greatest activity, but throughout the whole of the œstrous cycle.

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THE MIMICRY OF MALIGNANT DISEASE IN THE LARGE INTESTINE.[1]

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(Plates V.–VII.)

Within the last three years I have operated upon six cases of tumour of the large intestine, under the mistaken impression that I was dealing with examples of malignant disease. In all, the clinical manifestations and the macroscopic appearances supported my opinion, but minute examination of the specimens removed, or the subsequent clinical history of the case, has proved that, in all, the condition was of a non-malignant character.

It is well known that tuberculous disease, especially when affecting the cæcum or the ascending colon, may produce symptoms and signs which are with difficulty distinguished from those due to cancer. I have twice performed colectomy for supposed carcinoma, removing the cæcum and a part of the ascending colon in one case, and the cæcum, ascending colon, and a part of the transverse colon in another, when an examination of the tumour removed displayed the undoubted evidences of tuberculous disease.

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[1] A paper read before the Clinical Society of London, 14th December 1906.

But such cases are not very uncommon, and it is not with them that I propose to deal in this paper.

It is not, however, so well recognised that tumours of the large intestine, of the sigmoid flexure more especially, may present all the characteristic signs and symptoms of malignant disease, and yet prove to be nothing more than simple inflammatory conditions. The six cases whose details are given differ in character very considerably. The one circumstance common to them all is the close resemblance, indeed the identity, of the symptoms and signs with those of malignant disease. The following are the notes:—

Case 1.—A. C., æt. 28. Admitted into the Leeds General Infirmary on 2nd April 1904, complaining of passing blood in the motions, and of frequent and irregular action of the bowels. For a few days before admission she had suffered from intestinal obstruction, which had gradually become more and more acute. The abdomen was greatly distended; vomiting was frequent; and the general condition indicated a severe toxæmia. On examining the rectum, a soft, irregular mass was felt, involving the whole rectal wall. A note was made that the growth felt "like thick moss" on the rectal wall. The rectum was so narrowed by the growth that it was impossible to pass the index finger fully into it. A diagnosis of rapidly growing carcinoma was made, and colotomy was performed on 17th April 1904. Six weeks later the excision of the rectum was undertaken by the combined abdominal and perineal methods. Complete healing occurred in three weeks; the patient rapidly gained in health and strength, and is now (October 1906) quite well.

Description of the part removed.—The specimen (Plate V.), after hardening in formalin, measures 9 in. in length. The mucous membrane is greatly thickened, and its surface is raised up into prominent fleshy folds and convolutions. Over a part of the specimen there is a considerable degree of ulceration, which, by a process of undermining, has resulted in the formation of bridges and overhanging flaps and festoons of thickened mucous membrane. The thickness of the walls varies greatly, some of the tuberous projections of mucous membrane having a diameter of nearly half an inch; these projections are separated from one another by branching sulci in such manner as to give to the surface of the mucous membrane over the upper one-third of the specimen an appearance somewhat resembling the cerebral cortex. In the lower part of the specimen, ulceration has reduced the thickness of the mucosa in places to 1 or 2 mm. The muscular coat averages about 2 mm. in thickness; while external to this, in the lower part of the colon, is a layer of fat two-thirds of an inch thick. All the outer coats of the bowel are densely thickened and fibrous, and the lumen of the gut here is probably only about one-third of the normal. The inner surface of the bowel does not present any definite isolated tumour or polypoid growth, but there appears to be a general thickening of the mucosal rugæ, the tags of mucous membrane in the lower part of the specimen being detached at one extremity by ulceration.

Microscopical examination shows an overgrowth of the mucous glands. The glands are of irregular form and separated from one another by dense accumulations of lymphoid cells. Between the bases of the glands many smaller glands are seen, cut in transverse section; these, as a rule, present a very small lumen. Sections through an ulcerated patch show much the same appearances about the bases of the glands, where these are not disintegrated. Here there is more infiltration of the submucosa with round cells.

This condition is one quite unlike anything I have met before. As far as I am aware, no similar manifestations have been previously described, and the disease lacks a name. It is certainly not syphilitic, nor is it tuberculous. Of malignancy there is no suspicion. The only specimen in any degree resembling this that I have been able to discover in a search through the literature, is figured by Koch.[1]

Case 2.—*Perforative sigmoiditis; localised abscess.*—Mrs. H., æt. 58, seen in consultation with Dr. Norman Porritt, Huddersfield. The history was that the patient had always enjoyed exceptionally good health up till six years ago, when, after eating some tinned chicken and ham, she had ptomaine poisoning and was ill two months. Four years ago the patient had a severe illness, with much pain in the left iliac region. The doctor who attended her at that time told her she had "just escaped peritonitis." In this attack she was confined to bed for six weeks. Since then she has suffered from time to time from attacks of pain in the left iliac region, many of which have kept her confined to bed for a few days.

In November 1904 what proved to be a severe illness began with acute pain across the abdomen; this was followed by constipation, sickness, and abdominal distension. In spite of treatment by enemata, etc., the condition of obstruction grew worse, and on 4th December 1904 I opened the abdomen. There was considerable distension of all the intestines, and peritonitis with serous effusion. The seat of the trouble was found to be in the sigmoid flexure, a little above the brim of the pelvis. The bowel here for about 3 in. was thickened, swollen, and very hard. A perforation was found on the upper side, and a very copious deposit of lymph was plastered over and around this. The condition was thought to be one of malignant disease of the sigmoid flexure, with a perforation of a deep ulcer in the growth. A large tube was passed down to the open ulcer, and the rest of the abdomen closed. The patient's condition, to my surprise, gradually improved; but on 20th December 1904 a deep-seated mass between the median incision and the left iliac crest was found. The patient's temperature rose, and a second operation was performed, some pus being evacuated from an incision 2 in. to the left of the former one. The abscess cavity reached to the sigmoid flexure. This pus collection was clearly the result of insufficient drainage at the time of the original operation. The subsequent progress was good.

Dr. Norman Porritt kindly saw the patient on 1st October 1906, and reported: "The patient did well, and is now better than she has been for years. All the discomfort in the left iliac region, which was more or less always present after the ptomaine poisoning, has entirely left her, and the bowels, which never acted without medicine, are now spontaneously regular."

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[1] *Arch. f. klin. Chir.*, Berlin, 1903, Bd. lxx. p. 891.

The condition in this case has become clearer to me since I operated upon one of the cases related below. I think there can be little doubt that there was a perforation of a false diverticulum of the sigmoid flexure.

The appearance and the consistence of the tumour of the sigmoid flexure were such that we felt no doubt that malignant disease was present. The tumour resembled in all particulars that which I removed from Case 5, recorded below.

Case 3.—*Pericolitis transversa; colectomy.*—Mrs. W., æt. 50, was seen in consultation with Dr. Carlton Oldfield and Dr. Greenwood in May 1905. She had suffered for some months from occasional sickness and "indigestion." During the few weeks preceding my examination of her she had noticed great irregularity of the bowels. Constipation had been most obstinate; when relieved by an aperient, there was diarrhœa for twenty-four or forty-eight hours, followed again by constipation for several days. The patient was a very stout woman, but had lost nearly 2 stones in six months. On examining her abdomen, a hard mass was felt situated to the left of the umbilicus. This mass was about 4 in. in diameter, and apparently adherent to the parietes. A diagnosis of carcinoma of the transverse colon was made, and operation advised.

Operation, May 31, 1905.—On opening the abdomen the peritoneum was found to be indurated and gristly, about ½ in. in thickness. Involving the transverse colon and the adjacent omentum was a very hard, flat, irregular mass. The induration infiltrated the bowel and the omentum very widely. No enlarged glands were perceptible. No doubt whatever was felt by any of us, that the mass was a malignant growth in the colon. The whole tumour, with about 5 in. of the transverse colon, was removed, and an end-to-end anastomosis performed.

When the intestine was laid open, it was found to be firmly embraced and not a little constricted by a densely hard "scirrhus" mass. The most careful examination of the mucosa revealed no surface defect; the membrane was everywhere smooth and supple: there was no ulceration, and no diverticula could be discovered. Beneath the mucosa, which was freely movable on the deeper structures, was a wide infiltrating stratum of fibrous tissue, which involved all the other coats of the intestine, and spread into the omentum.

Microscopically, the mass surrounding the gut is seen to consist of dense fibrous tissue, containing here and there small aggregations of lymphocytes, particularly around the vessels. The mucous membrane is normal.

The origin of the inflammatory process in this case was not discovered. It would appear to have been an inflammation of the peritoneum surrounding the transverse colon with an infiltration of the contiguous omentum. No affection of the appendices epiploicæ was found. A condition of things exactly similar to this is known to occur in the sigmoid flexure.[1]

Case 4.—*Growth in rectum; protectomy.*—Mrs. S., æt. 41, seen with Dr. Waddington, Bradford. She gave a history of having suffered from diarrhœa for five months; small quantities of mucus at times tinged with blood being passed, sometimes as often as twenty times in the day. The rectum on examination was felt to be filled with a very soft, friable, ulcerating mass, fairly movable though extensive.

On 17th July 1905, a preliminary inguinal colotomy was performed, and a month later the removal of the growth was undertaken. The patient made a good recovery, and is now well. *Macroscopic appearances of specimen.*—The specimen (Plate VI.) measures 14 in. in length, and includes portions of the rectum and pelvic colon. The upper 8 in. of the bowel are normal, but below this the mucous membrane is covered with an exuberant cauliflower-like growth. At the junction of the healthy with the affected portion, the mucous membrane is undermined; below this is a flattened area which appears to be superficially ulcerated; adherent to it in places are tags of villous growth. The lowest portion of the bowel, extending to within an inch of the bottom of the specimen, is occupied by a soft and friable, projecting, papillomatous mass which is extensively undermined, forming a kind of bridge over a portion of the bowel. The whole circumference of the intestine is involved for a length of about 4 in. The obstruction to the bowel, partly by the exuberant growth, partly by a thick fibrous deposit in the wall of the intestine, is well marked.

Microscopical report.—Sections of the villous growth show delicate branching processes composed of a framework of fine connective tissue, and covered with a single layer of tall columnar cells, whose nuclei are larger and stand more irregularly at different levels than those of the cells covering the non-villous mucosa. Sections of the flattened areas of mucous membrane show the bases of the intestinal glands strictly limited by the muscularis mucosæ; but more superficially the cells are desquamating, and lie in many places entangled in a mucoid substance around the broken-down gland mouths. The lymphatic glands examined contained no epithelial deposits.

In the majority of the sections there is no evidence of malignancy, but in one place sections show irregularly massed epithelial cells extending deeply towards, but not invading, the muscular coat.

The clinical history and the conditions found on examination both justified a diagnosis of malignant disease in this case. Yet the condition is a simple one. There are multiple exuberant papillomatous growths undermined by ulceration, and a considerable thickening of the outer coats of the bowel due to a deposit of fibrous tissue has caused a moderate degree of stenosis.

Case 5.—*False diverticula of sigmoid; sigmoiditis; colectomy.*—Mr. A., æt. 52, seen with Dr. Helm of Carlisle, 2nd April 1906.

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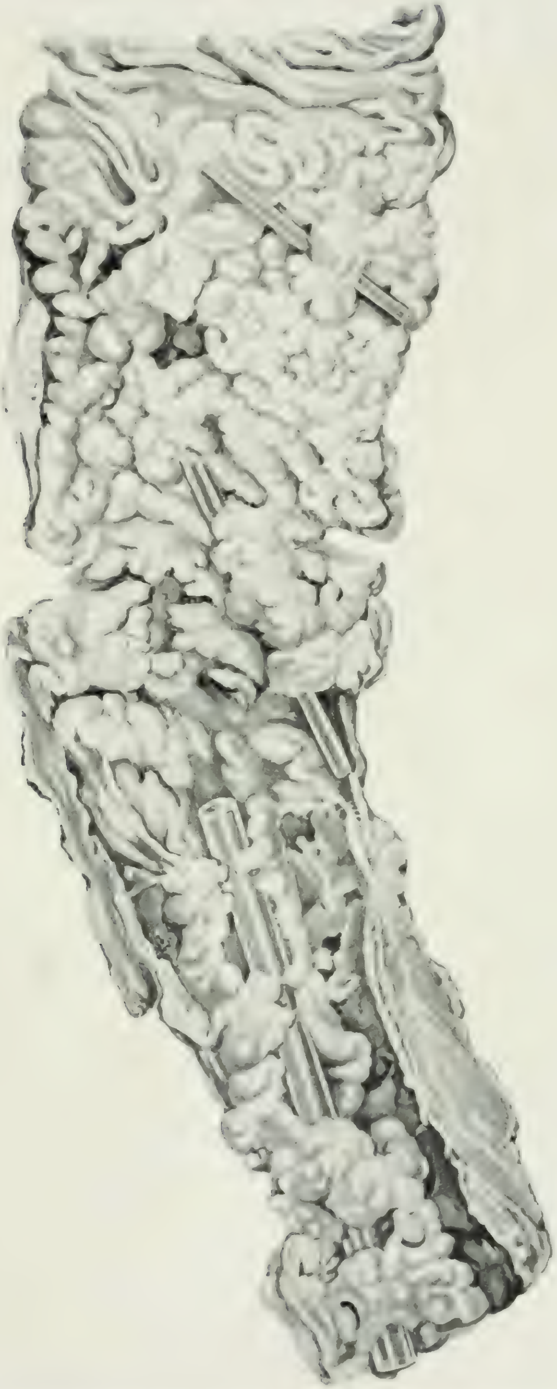
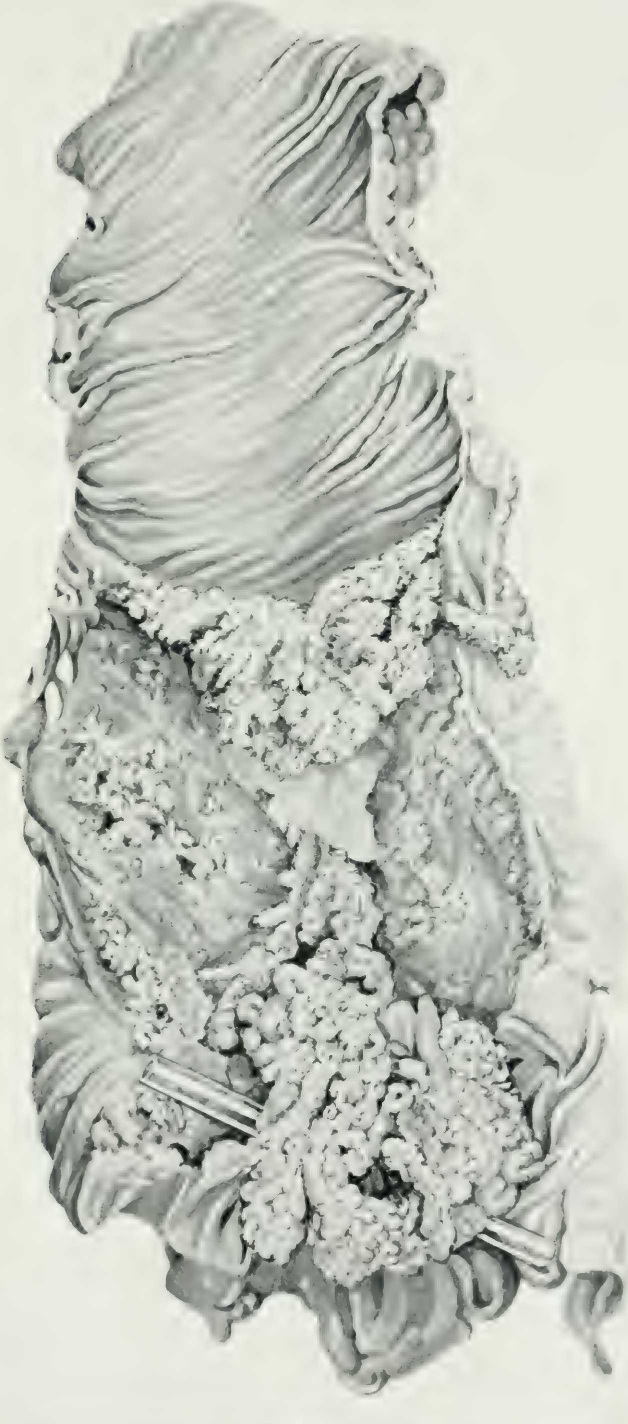
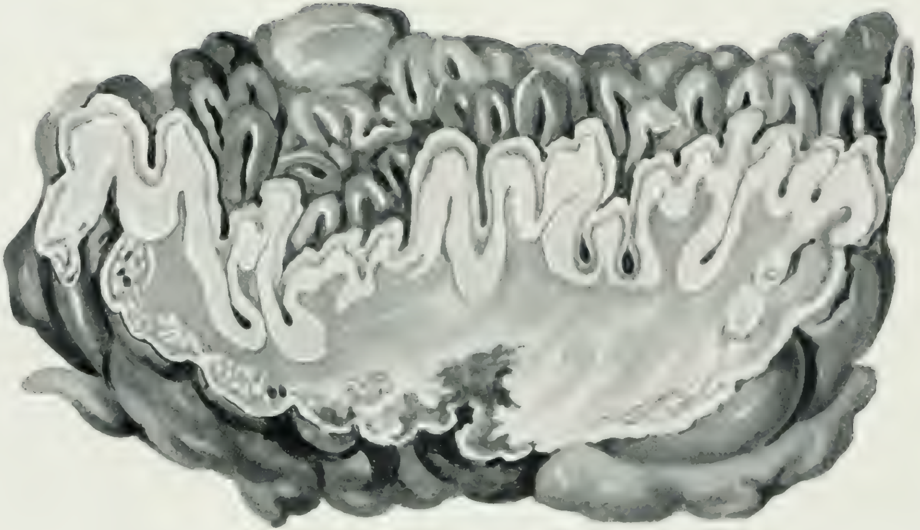
[1] See Saillant, "Sigmoidites et Perisigmoidites," Paris, 1906.



Specimen showing festooning of the mucosa, with great thickening of the intestinal wall. See Case 1.



Multiple papillomata: the glass rod indicates the presence of undermining. See Case 4.



False diverticula of the sigmoid flexure. See Case 5.

He had suffered from stomach troubles for a long time, but dated his present illness from eighteen months ago. He has attacks of pain in the abdomen which come on a varying time after food, from half an hour to three or four hours. He also suffers from a sense of weight and distension in the stomach, and frequently vomits. He vomited blood on one occasion, twelve months ago. The bowels are habitually constipated. During the last few months this has been a more serious inconvenience than before. On a few occasions, constipation has persisted for three to six days, and has given way only to persistent effort. On two occasions, five weeks ago and ten days ago, there was "intestinal obstruction." The abdomen became greatly distended, obstruction was complete, and vomiting of intestinal contents occurred. The last attack was so serious that it was feared operation might have to be undertaken for a possible growth in the large intestine.

Examination per rectum revealed nothing. The diagnosis was chronic duodenal ulcer with stenosis. A fear was entertained that there might also be a growth in the large intestine, though nothing could be felt.

At the operation on 4th April 1906, an inflammatory mass was felt in the duodenum. It was hard and fibrous, of the size of a walnut; there was evident duodenal obstruction. The large intestine was then examined, from the transverse colon, which was distended a little downwards. On reaching the ileo-pelvic colon, a hard mass was felt, which was thought to be malignant. As this was deemed the more important condition, the duodenal ulcer was left untreated and a fresh incision made over the tumour, which was very adherent to neighbouring coils of small intestine and to the abdominal wall. The adhesions were separated and the tumour delivered into the wound; the affected part of the sigmoid flexure, in length about 5 in., was excised and axial anastomosis performed. The patient recovered, convalescence being somewhat delayed by infection of the upper wound, which was sutured last. On 14th October 1906, the patient reported that he had "made very great progress."

The following is the report of Mr. H. Upcott upon the specimen:—

Macroscopical appearances.—The portion of bowel removed is about 5 in. long; the walls are greatly thickened, making the unopened specimen appear to be involved in a growth (Plate VII.). The external surface of the gut is reddened, lumpy, and in places flakes of lymph mark the site of recent adhesions to neighbouring coils of small intestine. On laying open the bowel, the mucosa shows no sign of growth or ulceration, though its lumen is slightly contracted by reason of the induration of the wall of the gut. This, in certain parts, is over 1½ in. in thickness, the increase being due to inflammatory exudation beneath the peritoneum. When the mucous surface is examined more closely, numerous pockets or diverticula are seen, some of which might contain the tip of a No. 10 English catheter. On cutting sections of the bowel wall parallel with the long axis of the pockets, these are found to be of variable depth, often twisted or slightly dilated at their blind extremities. The pouches are lined by thinned mucous membrane, and have pushed the circular muscle layer before them. Around the tips of the deeper pockets the muscular coat has become atrophied, but is traceable as a well-defined, white, fibrous-looking layer continuous with the unaltered muscular coat elsewhere. The extremities of one or two pouches are surrounded by an area of inflammatory extravasation, though no perforation can be actually demonstrated.

Microscopically. — The pockets are lined by normal mucous membrane, though about the bases of the gland cells, towards the apex of the pocket, there is an increased number of small round cells. Immediately beneath the glands lies the muscularis mucosæ; this can be clearly traced around the pouch. External to the muscularis mucosæ, and separated from it by some loose connective tissue, is the true muscular coat; if this be traced towards the extremity of the pouch, it is found to become thinned, its fibres being intermingled with fibrous tissue, and interspersed with aggregations of lymphocytes. Outside this fibrous layer which covers in the diverticulum, the wall of the gut is composed of loose connective tissue containing an inflammatory exudate, becoming more cellular towards the peritoneal surface, beneath which are numerous extravasations of blood. The peritoneum itself is covered with a delicate layer of fibrinous lymph, in the meshes of which are entangled numerous lymphocytes.

False diverticula of the large intestine are of great pathological interest. Acquired diverticula are found in all parts of the intestine, from the duodenum to the rectum. In the small intestine, though numerous, their clinical significance is of the slightest, for the thin fluid contents of the bowel do not readily become pent up in these little pouches. Gordinnier and Sampson[1] say that they have been unable to find a single case reported in the literature in which clinical symptoms have arisen from diverticula of the small intestine. In the large intestine the diverticula are not infrequently seen; the sigmoid flexure displays them more frequently than other parts of the colon. The false diverticula are always multiple; they are hernial protrusions of the mucosa and submucosa, along a track in the intestinal wall weakened by the passage of a vessel. Once developed, they are prone to become places for lodgment of the solid, slowly travelling intestinal contents. The various pathological conditions resulting from acquired diverticula are—

1. Chronic inflammatory deposit in the walls of the bowel, producing stenosis.
2. Localised peritonitis, which may lead to the formation of pus.
3. General suppurative peritonitis, the result of perforation.
4. Vesico-intestinal fistulæ, due to rupture of a localised abscess into the bladder.
5. Inflammation and thickening and contraction of the mesentery, in which the pouches lie (mesenteritis).
6. Carcinoma. Hochenegg has recorded the only case of cancer developing in a false diverticula.

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[1] *Journ. Am. Med. Assoc.*, 1906, vol. i. p. 1686.

Case 6.—*Tumour of transverse colon and splenic flexure (ileo-sigmoidostomy).* Mrs. W. S., æt. 62, seen with Dr. Holderness, December 1903. The patient has suffered for seven months from flatulence, colic, constipation, and loss of weight. During the last three months she has twice been confined to bed for periods of three or four days respectively with attacks of subacute intestinal obstruction. In the last of these I saw her, and on examination I found the abdomen distended; coils of small intestine were seen contracting and the cæcum ascending, and transverse colon could be seen to distend, and could be felt to harden. Loud rumbling noises were heard in the abdomen, and the patient told us that she had noticed these "bubbling" sounds for several weeks past. For the twenty-four hours before I saw her the patient had been very nauseated, and had vomited twice. The general condition was good. Shortly after my visit the obstruction yielded to a gravitation enema, the bowels being copiously relieved on several occasions, and the abdomen becoming soft and flaccid again. A diagnosis of malignant stricture of the splenic flexure was made, and the patient came to a nursing home for operation. On her arrival there the abdomen was hollow, the wall relaxed, and a tumour could be distinctly felt in front of the left kidney. When grasped between the hands, the mass felt of the size of a cocoanut.

Operation, December 14, 1903.—An incision was made in the left linea semilunaris, and the abdomen was opened. The transverse colon was found to be thickened and red; the descending colon and sigmoid flexure were pallid and empty. A large, excessively adherent mass was seen and felt, occupying the left end of the transverse colon. The mass was hard, smooth, but irregular in shape; it was adherent in all directions, to the abdominal wall, the stomach, the diaphragm, and to a few coils of intestine. Resection was impossible, and I had to be content with a short-circuiting operation. I secured the lowest part of the ileum, and united it to the sigmoid flexure (ileo-sigmoidostomy). The distal limb of the ileum was narrowed by enfolding sutures of linen thread.

The recovery of the patient was uneventful. Since the operation she has gained weight steadily; the tumour has entirely disappeared; nothing can be felt in the region it once occupied so fully. The bowels act well, and the patient's appearances justify her written statement that she "never felt better."

In this case I had no suspicion but that the tumour was carcinoma in a stage so advanced as to render resection mechanically impossible. But it is almost certain that I was mistaken, and that the tumour was a chronic inflammatory mass involving the colon. Its exact origin is quite uncertain.

The six cases here recorded have only afforded four specimens, but each of these is of considerable interest. Of the two other cases, I think it is safe to say that no one, seeing the conditions disclosed by the operations, would have hesitated for one moment to declare that the tumours were carcinomatous.

The inflammatory tumours of the large intestine, excluding the tuberculous conditions, are, it would appear, far more frequent than we have supposed. The exact nature of the conditions present are not always the same. The inflammation may begin in and penetrate the mucosa, a false diverticulum may form and may perforate, extensive undermining ulceration may be combined with a form of polypoid growth, or, finally, the inflammatory deposit may affect the peritoneal coat, chiefly or solely, leaving the mucosa supple and intact.

It is important to remember that the naked-eye appearance of the tumours in many of the cases is such that the mimicry of carcinoma is complete. Unless a careful microscopic examination is made, differentiation is impossible. It is, accordingly, not unreasonable to suppose that in some at least of the cases of "cure" after colectomy for carcinoma an error has been made of the kind to which I have drawn attention.

DEGENERACY.

By P. C. Smith, *formerly Medical Superintendent, Middleton Hall, Middleton, St. George.*

(*Concluded from page* 129.)

Etiology.—The condition may come on after an infective disease in childhood, but in the vast majority of cases it is congenital. Of the congenital cases, some are due to influences acting during fœtal life, but by far the greater number of degenerates are so because they come of a degenerate stock, the unit of degeneracy being the family rather than the individual. But what causes a family to be first attacked by degeneracy? A complete answer to this can hardly be given till the histories of many degenerate families have been thoroughly investigated, and such is far from being the case as yet. Some causes, however, are known. Drunkenness on the part of a parent at the moment of generation, great difference of age in the two parents, disease, malnutrition or great excitement on the part of the mother during pregnancy, and disease during infancy, may all bring about the condition. So also, in all probability, may some form of chronic intoxication, or a permanently unhealthy condition, on the part of the parents prior to conception, or perhaps rather on the part of some more remote ancestor. All these conditions interfere with nutrition; so we are probably justified in asserting that the cause of degeneracy is always malnutrition, either on the part of the individual first affected during his fœtal life or infancy, or on the part of one of his forefathers. Malnutrition has been present in all cases where the antecedents have been ascertained; experiments on the eggs and embryos of animals show it to be a *vera causa*: and, indeed, it is difficult to imagine any other cause.

Some biologists deny that faulty nutrition in the ancestors can produce degeneracy in the descendants, but their arguments are not clear. Dr. Archdall Reid writes:

"It is widely believed, especially by medical men, that the conditions of life to which parents are exposed cause inborn changes (*i.e.* variations) in their offspring. Thus it is supposed that parental ill health, due to disease, intemperance, want, hardship, bad hygienic conditions, and the like, cause offspring to be 'degenerate': whereas opposite conditions have a contrary effect. A necessary corollary to this belief is the hypothesis that races, when exposed to conditions adverse to the individual, degenerate owing to the accumulation of injury during successive generations; whereas they improve when exposed to beneficial conditions.

"On the other hand, a smaller section of the public, mainly biologists, who, however, have made a special study of heredity, believe that races improve only under conditions adverse to the individual, and degenerate only under conditions beneficial to him. In other words, they attribute racial improvement (evolution) to natural selection, to the elimination of the unfit, which, of course, can occur only under adverse conditions, and degeneration to lack of selection, which can occur only when the conditions are beneficial. A corollary logically flowing from this belief, but not always clearly apprehended, is the hypothesis that the conditions to which parents are exposed before the birth of their offspring do not cause variations in the latter; for, of course, were offspring made degenerate (*i.e.* inferior at birth to what their parents were at birth[1]), natural selection could not effect an improvement, whereas, if offspring are improved by beneficial conditions, there could be no degeneracy under such circumstances. Clearly, the biological theory is fundamentally incompatible with the medical one."[2]

The above passage seems to confuse two different things: First, a hard life in the sense of a life necessitating strenuous (but healthy) work, which will kill off the feeble, and make the strong stronger; secondly, a life of disease, intemperance, and starvation. It may freely be granted that the former is beneficial to the race, but has it ever been shown that the latter has done good? Has a race ever existed of which all who propagated their species were half-starved, drunken, or diseased? Dr. Reid appears to postulate such a race, and to imagine that surviving mankind is descended from it.

The biologists who deny that malnutrition in the ancestors can produce degeneracy in the descendants, explain this alleged fact by asserting that germ-plasm remains unaffected by the nutritive conditions of the body in which it exists, and from which it must derive its nutrition. One would like to see the evidence for this remarkable proposition. Strong arguments have been brought forward to the contrary; and till they have been convincingly answered, we may be forgiven for doubting if germ-plasm can differ so fundamentally from other protoplasm.

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[1] Though it does not affect the argument, it may be pointed out that this cannot be accepted as a definition of degeneracy—at any rate, in the sense in which the word is used here.

[2] *The Morning Post*, 1905, August 14.

Dr. Reid's obverse proposition—that conditions beneficial to the individual are adverse to the race—can be accepted only if "beneficial to the individual" be taken to mean making life easy for the individual.

The statement thus interpreted is doubtless true, and affords an explanation of the origin of many cases of degeneracy, though the explanation is hardly one of which Dr. Reid would approve. An easy life undoubtedly interferes with natural selection. It probably also interferes with sexual selection, or, rather, sexual selection in such circumstances often acts along lines that do not promote the welfare of the race. But, after all, interference with natural and sexual selection merely promotes the spread of degeneracy, and does not initiate it. An easy life may originate degeneracy, not by interfering with natural selection, but by leading to unhealthy modes of existence that impair the nutrition of the individual, and through him that of his descendants: it is very likely true that to *panem et circenses* was due the extinction of the true Roman race long before the barbarians descended on Rome.

Degeneracy is found among all civilised nations, in all ranks of society, and in both town and country. Petrén found that in Sweden neurasthenia was commoner among the artisans and peasants than among those more highly placed, and that the majority of cases came from provincial districts where life was calm and simple.[1] It is true that neurasthenia is not invariably a manifestation of degeneracy; but it so frequently is so that we are justified in holding that where there is much neurasthenia, there is a good deal of degeneracy. As regards the relative disadvantages of town and country life, it is hardly wise to draw inferences from Sweden, which has only four towns of over 20,000 inhabitants, and the largest of these is built on islands with wide water-ways that provide channels for fresh air. It is probable that overcrowding, with its consequent want of fresh air and want of exercise, is a factor in the production of the condition, even apart from the dirt, poverty, intemperance, and impure and improper food that so often accompany it. Those who maintain that the nutritive conditions of ancestors cannot affect their descendants, point to China as a country where, they say, long overcrowding has failed to produce degeneracy. This statement presupposes a greater knowledge of Chinese demography than I have the fortune to possess. Before the argument can be accepted, it must be shown that *all* the following conditions are present: that the population, which according to the Almanach de Gotha is much less dense over the whole country than that of England, is largely huddled into big towns (this, I believe, is the case): that these towns are not constantly recruited by fresh blood from the country districts; that there is little or no degeneracy in the towns; and that infanticide and other social customs are not practised in such a way as to eliminate the unfit. Even if all these propositions can be demonstrated, we arrive only at the conclusion that overcrowding alone is not a sufficient cause, and have not disproved the statement made above that it is a factor in the production of degeneracy. There are doubtless many factors, and they vary in different countries and at different times. Here it may be noted that the causes of degeneracy at any one epoch are to be looked for not in the conditions of that period, but in those of a generation or two previously. It is not very long since this country passed through a stage in which there was great industrial development coupled with a lack of consideration for the young, so that children in great numbers were made to work far too hard, and in very unhealthy surroundings. The degeneracy born of this state of affairs has probably not died out yet. At present we are better in some respects, and worse in others; there is less elimination of the unfit than ever, and there is more crowding into towns. We are in a state—a transition state, it is to be hoped—in which natural selection has largely disappeared, and the practice of eugenics is hardly born; the conditions of life, however, are healthier on the whole.

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[1] See *Brit. Med. Journ.*, London, 1901, vol. ii. p. 736.

It is interesting to observe that degeneracy occurs not only among the very rich and the very poor, but also among the middle classes. It would be important to find out the exact circumstances of the member of the family who first showed signs of degeneracy, but that unfortunately is difficult—ignorance of the nature of the condition, ignorance of family history, and unwillingness to confess to unpleasant truths, all combine to prevent successful investigation.

It will be well to inquire into the mode in which degeneracy is distributed in families. Here again we meet with the same difficulties, and it is impossible to make a definite statement at present. The following propositions are put forward tentatively and with much diffidence. They refer to Group 4 only, my acquaintance with Group 3 being insufficient for me to venture on any formulæ with regard to its distribution.

1. If a degenerate marries a non-degenerate, all or most of the offspring will be degenerate, the proportion of affected children being much in excess of what would be expected according to accepted theories of heredity. If the unaffected partner be very healthy, the children may on the whole be less affected than the degenerate parent; and thus a series of marriages into strong

stocks may prolong a degenerate family, and probably even eradicate the degeneracy in time.

2. The union of degenerate with degenerate produces offspring more strongly affected than does the marriage of degenerate and non-degenerate. I do not know if the average amount of degeneracy in the children is always greater than that in the more degenerate of the two parents.

3. It occasionally happens that in a family of brothers and sisters some show signs of degeneracy and others do not.

4. The union of an apparently unaffected member of a degenerate family with a non-degenerate may produce degenerate offspring. I am not sure of this, however; signs of degeneracy on the part of one or other of the parents may have passed unobserved.

5. Males are more often affected than females.

6. The condition is more readily transmitted by males than by females; the offspring of a male degenerate and a female non-degenerate will (other things being equal) be more affected than the children of a female degenerate and a male non-degenerate.

7. Degenerates may have large families; nevertheless degenerate stocks tend to die out, partly from the diseases to which they are liable, and partly from diminution in sexual power.

It will be seen that the mode of occurrence of degeneracy follows in part the laws of blended heredity, and in part it follows either the laws of a very complicated form of heredity (a form in which a number of different inherited qualities interact), or no laws of heredity at all.

This last possibility is indeed the most probable. Dr. Féré holds that degeneracy is a progressive dissolution of heredity—in other words, that a degenerate family is one in which there is a diminution, tending to increase in successive generations, of the power to transmit fully the characters of the race. I have not seen a statement of his reasons for this belief, but one can imagine at least some of them. In the first place, imperfect development occurring over a wide range of structures does constitute a loss of racial characteristics; and secondly, the faults of development are not usually the same in parent and child, so that the latter cannot be said to inherit his abnormalities from the former. It is true that Dr. Magnan has more than once seen similar obsessions in father and child, and once he met with a case of the mania of making unnecessary purchases in three generations of a family. I have seen physical defects on the part of the father recur in more of the children than chance would account for. But these cases are rare, except in the commoner abnormalities, which might be expected to occur in succeeding generations. It is also true that unlikeness between the developmental faults of the parent and those of the offspring might be described as heredity of the kind known as "dissimilar." But, as I have pointed out elsewhere,[1] and shall presently point out again, dissimilar heredity is no heredity at all. On the whole, we seem justified in saying that a degenerate family is one whose members present losses of racial characteristics, and that these losses cannot strictly be described as inherited, seeing that they vary in successive generations, and in different members of the same generation. If we consider, in addition to this, that the racial characteristics tend to diminish more and more, and finally disappear with the extinction of the family,[2] we shall probably feel justified in agreeing with Dr. Féré. We may doubt, however, if his statement constitutes a full view of the subject. In those cases in which degeneracy is due to ancestral malnutrition, the dissolution of heredity is no doubt prior to other manifestations; but when degeneracy results from disease in intra-uterine life or infancy, the other faults of development must arise simultaneously with that which causes loss of the power to transmit fully the characteristics of the race.

We may now venture to define degeneracy as a state of imperfect development, originating probably in malnutrition on the part of an ancestor or of the individual during the period of growth, affecting many or all of the bodily systems and functions, and always involving a dissolution of heredity.

COMPLICATIONS.—As we have seen, degenerates are more liable than sound persons to attacks of indigestion, to rickets, infantile scurvy, catarrhs, infections and relapses in infective diseases, to local syncope, local asphyxia, and local gangrene, and to the various neuroses and psychoses. They furnish also a disproportionately large number of cases of arterio-sclerosis, Bright's disease, consumption, locomotor ataxy, and perhaps heart disease.

Catarrhs are presumably due to abnormalities of lymphoid tissue and mucous membranes, and indigestion to abnormalities of mucous membranes and digestive glands. The predisposition to rickets and infantile scurvy is also probably caused by faults of chemical or histological structure. What these faults are we do not know, but it must be remembered that, even in infective diseases, the causes, other than bacterial, have still to be worked out.

Local syncope, asphyxia, and gangrene are extreme examples of the almost invariable vasomotor instability, which must be chiefly due to defects in the central nervous system, though partly, no doubt, to imperfect development of the blood vessels. The exciting causes of these conditions have also to be taken into account.

The neuroses — neurasthenia, hysteria, epilepsy, paralysis agitans, chorea, hemicrania, neuralgia, professional spasms, astasia-abasia, angio-neurotic œdema, and probably the others also — occur most frequently in degenerates, as the state of the nervous system in these would lead us to expect. The three cases of "waking palsy" that I have met with occurred in members of a neurotic family who showed no signs of hysteria. Two of these cases occurred in the same individual, and were remarkable for the wide extension of the paralysis. The patient woke in the morning in possession of his sensory and intellectual faculties, but unable to move or to contract any voluntary muscle, except apparently those of the eyes, for he stated that he looked about him though he could not move his head. He made several efforts to move, but they seemed to him to be checked at the outset. At last one attempt proved successful, and the whole paralysis vanished at once. The whole phenomenon appears to have lasted a few seconds. This patient presented slight anatomical and functional stigmata.

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[1] *Brit. Med. Journ.*, London, 1906, vol. i. p. 495.

[2] The characteristics do not diminish steadily till they reach the vanishing point; but that is because the early loss of some of them brings about the extinction of the family before the other losses have proceeded very far.

Epilepsy, hysteria, and neurasthenia bear a relationship to degeneracy different from that of the other neuroses. These others are caused by special influences acting on a degenerate constitution. "Essential" epilepsy, in all probability, is simply a manifestation of degeneracy, though it may be aggravated by peripheral irritation. As to neurasthenia, we have seen that the minor form is a manifestation of degeneracy, and the major form is nearly always—here and in North America at all events—an exacerbation of the minor, the exacerbating agents having no action of a kind that can be called special, but being such as always aggravate the symptoms—mildly and temporarily if the action is only mild and temporary. Proust and Ballet hold that the majority of adults suffering from neurasthenia major have acquired the disease *de novo*, and show no hereditary or constitutional taint.[1] In the United States, however, Dr. Dana believes that there is inherited weakness of nerve structure in the vast majority of cases,[2] and my experience in this country and elsewhere points in the same direction. I have found very few neurasthenics who have not previously shown signs of neurasthenia minor, and who have no neurotic family history and no anatomical signs of degeneracy. When neurasthenia major does arise *de novo*, its causes are such as produce a state of chronic fatigue similar to that which is found in degeneracy. Hysteria may have an exciting cause, in the form of shock, but it seems occasionally to develop as a mere aggravation of some of the features of degeneracy—the aboulia and the narrowing of the field of consciousness. When it is accompanied by an exacerbation of the mental symptoms of degeneracy, we have the condition known as hystero-neurasthenia. It is said, however, that in traumatic cases of hystero-neurasthenia, due to railway accidents, earthquakes, and such sudden catastrophes, there may be no predisposition to nervous complaints. Hysteria may no doubt occur apart from degeneracy. In the widespread epidemics of hysteria in the Middle Ages, and even later, it is very unlikely that all who were affected were degenerates; undeveloped minds seem liable to fall into hysteria from imitation. Again, it seems that there is a deliberately induced form of hysteria, unconnected with degeneracy, and caused by long contemplation of a single concept that appeals to the emotions, that is to say by deliberate narrowing of the field of consciousness with simultaneous induction of an emotional state; this is seen in certain barbaric religious rites.

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[1] "The Treatment of Neurasthenia," p. 12.

[2] "Twentieth Century Practice of Medicine," vol. x. p. 753.

As regards the psychoses, it is very likely that the great majority of the insane are degenerates; all sufferers from dementia præcox seem to be so, a great many cases of general paralysis, senile dementia, delusional insanity and melancholia, and a considerable number of cases of acute mania. The so-called volitional insanity and moral insanity are states of degeneracy. It has often been said of late that when a patient with neurasthenic symptoms shows evidence of insanity, the case has been one of insanity from the beginning. This is often true. But it is also often true that what has existed from the beginning—from the beginning of life—has been neurasthenia minor; various features of the early insanity have made the neurasthenic symptoms more manifest, and perhaps the exciting causes of the insanity have aggravated them.

It is among the neuroses and psychoses that cases of "dissimilar heredity" occur. It is difficult to understand how the occurrence of one disease in the parent and another in the offspring can be described as heredity. No doubt it might be the case that what is inherited is an unstable nervous system. But this will not account for the frequent presence of bodily abnormalities which differ in the two generations, nor will it afford a sufficient explanation of those cases where the descendant's neurosis or psychosis is congenital. If there be such congenital disease, there must be more abnormality in the descendant's nervous system than mere inherited weakness will account for. The true explanation of the cases seems to be that there is no heredity in the strict sense of the word, but that both ancestor and descendant are degenerates, and that the degeneracy, being a dissolution of heredity, manifests itself differently in the two.

Locomotor ataxy, like general paralysis, seems to affect the neurotic by preference, and the same may be true of other organic diseases of the nervous system.

It is possible that the special liability to phthisis occurs only in those degenerates whose anatomical stigmata include thoracic malformations or hypoplasia of the pulmonary or other vessels; but there is some evidence in favour of the theory that degenerates are peculiarly liable to all forms of tuberculosis. It is said that those whose secretion of adrenalin is deficient (and the tone of whose arteries is consequently low) are more liable than others to tubercle.

Arterio-sclerosis and Bright's disease, when they occur in these cases, are probably due to irregular flushings and contractions of vessels that may be congenitally imperfect, to toxic agencies arising from the faulty metabolism that is usually present, and perhaps to further toxins produced during the frequent periods of mental stress. We have already seen that albuminuria and tube-casts sometimes occur as transitory phenomena in some of the insane and neurasthenic.

If heart disease really be more common in degenerates, as seems not improbable, we have possible explanations in imperfect structure, in toxins, and in the action on the heart of frequent fits of excitement.

Some degenerates die of suicide, and it occasionally happens, I am sorry to say, that one perishes at the hands of the executioner.

DIAGNOSIS.—The only question of importance under this head is the differential diagnosis of insanity and the forms of degeneracy classified as Group 3, above. Indeed, two of these forms—moral insanity and volitional insanity — have been classified by the Medico-Psychological Association as true insanity, which in that case will not necessarily connote intellectual obfuscation among other things. If the term insanity is used to denote all cases in which there is failure of one or more of the mental faculties, not due to the direct action of toxic agencies, then its scope will be very wide indeed, including even those who have no ear for music! Perhaps, however, the word is used practically rather than scientifically, signifying mental failure of such a nature as to render the patient dangerous to himself or others, or incapable of managing himself or his affairs. But from the medico-legal point of view, it certainly seems desirable to make a distinction between those with clouding of the intellect and those who are merely subject to morbid impulses; the effect of punishment is different in the two cases. Perhaps medical men would agree to this distinction more readily if lawyers for their part would admit a condition of "diminished responsibility" in those who, as the result of developmental defect, have stronger impulses and weaker resisting influences (instinct, ingrained habits, will) than normal persons. Even to those who hold that intellectual derangement is a necessary condition of insanity, the diagnosis between insanity and degeneracy is not always easy. A full examination of all the mental faculties must be made in each case. A degenerate will sometimes surround himself with a fence of sullenness and reserve, but by the exercise of some tact this may usually be broken down, and his confidence gained, and the observer will then find him sensible, and succeed in making him judge his own actions reasonably.

It should be said that some authors hold that there is always a certain degree of intellectual defect in moral and volitional insanity, though it may be difficult to find. This doubtless is so, for mental deficiency in one direction must react on all the processes of the mind; but is the intellectual failure in these cases much more than is present in many sane and non-degenerate persons, whose lack of education, or whose education along faulty lines, has left them with imperfect perceptive powers and confused conceptions of things and their relations? There is a steady slope from perfect sanity to insanity, but most of the intermediate positions are merely temporary states, and it is easy to divide men by certain broad lines. Such a division will probably result as follows: those who, to all intents and purposes, are of perfectly sound mind; the neurotic; the more marked degenerates (Group 3); the insane.

TREATMENT.—Degeneracy may be eradicated from the race. It may also be eradicated from the family, by a series of marriages into robust families, though the wisdom of sacrificing these is doubtful; moreover, degenerates have a tendency to marry one another—"*les névrotiques se recherchent.*" It is highly improbable that it can ever be eradicated from the individual. Possibly, however, means may hereafter be found to ameliorate the condition by the use of multiple extracts of glands or other physiologico-chemical medicaments; and even at present a degenerate may be so trained that the various neuroses and psychoses and other disorders to which he is liable shall be less likely to supervene. No doubt the power of education is, as has been said, inferior to that of heredity; but it may reasonably be supposed that the degree of inferiority has been exaggerated, for education has never had fair play. Has any man ever been systematically educated, in the full sense of the word, from his birth onwards?

Prophylactic treatment of degeneracy in the race.—Dr. Archdall Reid, in the passage already quoted, maintains that the preventive of degeneracy hitherto has been natural selection, or the elimination of the unfit, a condition that is found only when life is strenuous. This is true, but it may be hoped that, as mankind becomes more civilised, there will be a more deliberate form of selection in accordance with Mr. Galton's science of eugenics, a science that will show the undesirability of the marriage of degenerates. Doubtless it will be long before this acts to any considerable extent; but the path of evolution seems to run rather in this direction than in that of Dr. Reid. We may also hope that the causes of degeneracy will to a great extent disappear in time; there will then be few new cases, and the already affected families will follow their natural progress to extinction.

Prophylactic treatment of complications in the individual.—This consists in a thorough and systematic education from the hour of birth. The body must be made as healthy and vigorous as possible; good habits must be ingrained from the very outset, so as to become true reflexes; and every mental faculty must be developed. Sensory acuteness, memory, perception, observation (which involves attention), activity, a correct motor response (including inhibition) to sensory stimuli, co-ordination, comparison, the appreciation of cause and effect, reasoning, imagination, method, judgment, decision, will, self-control, perseverance, self-reliance, initiative, courage, sense of duty, sense of honour, patience, truthfulness; also good ideals, and the emotions, including sympathy and reverence, but with careful direction and limitation;—all these must be systematically developed.

It would be out of place to attempt a complete treatise on education here. The reader may be referred to the excellent works of certain medical men, as Dr. W. B. Drummond, Dr. de Fleury, Dr. Thulié, and Dr. Warner, but he ought certainly to go further, and study the writings of Fröbel or his disciples. The science of education should be studied by every parent, medical man, and teacher.

There are, however, some points, having special reference to the neurotic, which may be referred to here. It must be remembered that metabolism is defective in these cases, and every care must be taken to maintain a sufficiency of nutrition, including oxygenation, and of warmth, sleep, and exercise. An abundance of fresh air is almost as important as in phthisis: windows should be kept open as widely as possible night and day, blinds should not be lowered even at night, curtains should be abolished, and during the daytime the child should be as much as is practicable in the open air. Houses are unhealthy things at best, and all should be so trained that they will like better to hear the lark sing than the mouse squeak.

As regards the feeding of those infants who cannot be nursed, Dr. Pedley appears to have proved his point that the teats of feeding-bottles are most unsuitable, that the child should be taught to drink from a cup as soon as possible, and that till it can do this its bottles should have large teats that approximate in size to the part of the maternal breast that the infant holds in its mouth while feeding.[1] In respect to the food of older children, milk and cereals have perhaps been too much insisted on, valuable though they are. In most other matters we regard natural craving as some indication of what is beneficial, and it is difficult to see why a contrary opinion should prevail in the case of food. No doubt the cravings that ought to be considered are those of the healthy individual; but even a robust child does not prefer rice pudding to roast beef with the degree of fervour that his parents usually desire. In the case of those degenerate children who suffer from frequent attacks of pyrexia, Dr. Eustace Smith has shown that these attacks are often accompanied by indigestion (certainly this is not always the case), and seem to be caused by milk and farinaceous food.[1] Any harmful effects of animal flesh on children can hardly be due to the albumin in it, and probably depend on purins. These are absent from eggs, which are a most valuable article of diet from all points of view; they are liked by children, are highly nutritious, are free from purins, and contain lecithin, which has important effects on metabolism.

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[1] See his paper in *Brit. Med. Journ.*, London, 1906, vol. ii. p. 989.

The cold douche is much praised, and is certainly very important when it can be borne, but there are some neurotic children who cannot tolerate even the mildest form of it. Its effects should be carefully watched.

Free play is the only form of exercise that is suitable, in most cases, to these children while they are very young. Massage may do good, but it must be closely supervised, for it may bring on an attack of fever in a neurotic child, and so perhaps may Swedish exercises. It is most important to avoid fatiguing any child, or allowing him to fatigue himself. Fatigue may do serious harm.

Other points not often mentioned in connection with the physical upbringing are as follows: have a child's organs of special sense and respiratory apparatus, including the nose, tested occasionally, and any remediable defect corrected; break down any preputial adhesions in infancy, and do not let them form again—ordinary cleanliness will prevent this; avoid residence in relaxing climates, and live in the country rather than in a town. In day-schools in towns the children should always be turned out to play for an hour daily in a large playground—a grass field is far better than a cemented court. This should be done during school-hours, so that advantage may not be taken of the recreation time by parents to send their children on errands, nor by the children themselves to loaf in the streets.

In the ingraining of good habits, one of the most delicate to deal with is that of activity. At first sight it might seem enough to say that the child should have ample rest, but when not reposing should be constantly active, working when he works, and playing when he plays. But it must be remembered that in neurotic subjects neither body nor mind can be kept on the stretch for long, and that change of occupation is a very imperfect preventive of fatigue. It is not without a cause that degenerates indulge in dawdling when children, and in day-dreaming and introspection when older. These habits, bad as they are, enable a tired nervous system to repose, and, though they should be rigidly suppressed, something even more restful must be substituted. One cannot lay down precise rules; all that can be said is that these children should be encouraged in activity and not allowed to dawdle, but should be closely watched, and on the slightest symptom of fatigue showing itself should be made to rest; a few words to them now and then while they are lying down may prevent their minds from straying in undesirable directions.

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[1] *Brit. Med. Journ.*, London, 1906, vol. i. p. 307.

Education of the senses is particularly needed in degeneracy, as hysteria and some forms of insanity consist largely in narrowing of the field of consciousness, with the result that the mind is too much governed by organic sensations; in a less degree, this produces brooding. It has already been shown that consciousness varies greatly in different individuals, and the best means of developing it seem to be, first, cultivation of sensory acuity and of observation, and, secondly, formation of the habit of causing sensory stimuli to be followed by appropriate action rather than to spend themselves in diffuse emotional movements. Education of the senses is also of use in improving the nutrition of the nerve cells and promoting the growth of association fibres. Two practical points must be mentioned: first, that sensory excitations soon tire children and should not be pushed too far; and, secondly, that all the senses should be developed. Owing to the complex associations of the nervous system, anything that appeals to several senses will have far wider relations than if it acts on one sense only, and the perception and recollection of it will be correspondingly clearer. It has even been held that a cause of the want of mutual comprehension between philosophic writers of different schools is the fact that one school prefers sense-images of one mode (*e.g.* tactual or visual), and another prefers those of a different mode; and that relations conceivable in the terms of one mode often fail to be conceivable in terms of another.[1] It is more than possible that there would be a general rise of intellectual power if we ceased to neglect certain of our senses as we do at present.

The importance of a motor education must also be insisted on. To allow sensory stimuli to result in diffuse emotional movement rather than in prompt and appropriate action, is as bad as to permit the senses to remain half-developed and to throw the child back on his organic sensations. It leads to narrowing of the field of consciousness, to emotionalism, and to day-dreaming; it leaves parts of the central nervous system undeveloped; it results in perpetual inability to perform certain complex actions which must be learned during the plastic age; and it leaves the will weak and the individual inefficient, not only in emergencies but also in the ordinary affairs of life. To be possessed of all-round physical dexterity is to feel a sense of mastery that brings with it a greater love for action, and renders one more prompt and energetic. A motor education is an education of the will. To attain this, it is not enough to check "extra movements";

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[1] Fraser, *Am. Journ. Psych.*, 1892 (referred to by Donaldson in "The Growth of the Brain," p. 349).

activity must be encouraged, and co-ordination must be carefully trained. The effect of well-co-ordinated movements of small parts (as the fingers) on the development of the intellect need only be referred to here.

It may be pointed out that a well-directed sensori-motor education increases the happiness of life, and that happiness is not only desirable in itself, but is an important educational agent: it improves the nutrition of the nervous system, stimulates the mental faculties, elevates the emotions, and causes the individual to be less self-centred and a better member of society. Marshall has shown that "all pleasure is the coincident of surplus-stored force, and that all pain is the coincident of organic conditions which imply that the energy of reaction is less than that which should be expected to result from the stimulus reaching the organs whose action determines the mental elements in each case."[1] If we substitute the words "happiness" and "depression" for "pleasure" and "pain," this is probably true. Now the unfortunate subjects with whom we are dealing suffer from chronic fatigue of probably all the nerve centres, and accordingly we find that, even if pleasures strew their path, there is an undertone of unhappiness in their lives. To the healthy man the very process of living is pleasurable: it is not so with these. This cannot be entirely prevented, but the unhappiness can be lessened by improving the nutrition of the nerve centres, and such improvement may be effected by well-regulated exercise of those centres. Moreover, a satisfactory education will give more mastery in dealing with the many little cares and difficulties of life, and so will prevent much worry and depression. It is the day-dreamer, the brooder, and the sentimentalist who worry; the sensori-motor individual acts.

A potent factor of happiness is the power to roll away distressing thoughts from the mind. This is one aspect of attention, which should, of course, be inculcated.

Ideals should always be cultivated, and good habits, moral qualities, and the laws of morality are best ingrained by making them into ideals. Among the things thus instilled may perhaps be included certain aims that are specially or solely desirable for the subjects of whom we are treating. First of these comes celibacy, and after it perhaps abstinence from such drugs as alcohol and tobacco. The question of alcohol is difficult, however; neurotics can often get more out of their lives by a sparing use of it, but, on the other hand, they are frequently liable to take it to excess. As to celibacy, there is no doubt. Neurotics should not marry, chiefly for mankind's sake, but also for their own. Those who are not suited to family life usually find family life not suited to them. Many neurotics are refined, ardent, and high-minded, with much intellectual ability and moral fervour; and many more might become so if suitably brought up. Monasteries are excellent institutions for such as these; and it would be well if all who are capable of good work, but who are unfitted for the struggle of existence, could find a refuge where they might lead a peaceable and useful life, and one that would stimulate their higher faculties, always under guidance, and with the strict condition of celibacy.

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[1] "Pain, Pleasure, and Æsthetics," p. 218.

It would be well if the subject of degeneracy were studied by schoolmasters. It is impossible to educate well those who exhibit it, unless one comprehends and knows how to deal with their peculiarities—their ready tiring; their need of much sleep; their deficiencies in sensation and action; their lack of attention, perseverance, and will; their occasional spurts, which overtire them and make them worse; their impulsiveness, which leads them to inconsistent acts; their excitable, irritable, and generally unequable temperament; the readiness with which they are led for good and ill, and the difficulty of keeping them in the right way; their sensitiveness; their peculiar dangers.

It would be well also if the subject were studied by jurists and by criminal lawyers.[1]

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[1] Besides the authors already referred to, I must express great indebtedness to Dr. Ch. Féré ("La Famille Névropathique"), Dr. V. Magnan ("Recherches sur les Centres Nerveux"), and Mr. R. P. Halleck ("The Education of the Central Nervous System").

REVIEWS OF BRITISH AND FOREIGN LITERATURE.

Anæsthetics and their Administration. By FREDERICK W. HEWITT, M.V.O., M.D. Third Edition. London: Macmillan & Co. Ltd.

A KNOWLEDGE of anæsthetics and their administration forms a most important part of the professional equipment of the medical man. No longer can the doctor afford to acquire his knowledge of anæsthesia in the haphazard fashion of even a few years ago. The subject has advanced quickly, and the public have become educated to appreciate the significance it possesses in surgical work. They know that chloroform and the anæsthetic are not synonymous terms. The anæsthetist is a recognised specialist, and his services are requisitioned by both patient and doctor. The cry is becoming louder for special instruction in anæsthetics, and its recognition as an integral part of the medical curriculum. Many medical men even yet, however, fail to appreciate the important influence a properly chosen and well-administered anæsthetic may have upon the success or failure of an operation.

Dr. Hewitt's book, the third edition of which is before us, with its wealth of information, cannot fail to convince those who read it that anæsthetics and their administration constitute a large subject which requires long and careful study, as well as much practical experience, before the skilled administrator can be produced. The author entitles it a text-book for medical and dental practitioners and students, but it seems to us more suitable for instructors in anæsthesia and those who wish to make a special study of the subject. It is encyclopædic in its information, and much too elaborate for the medical student. The ordinary anæsthetics are fully discussed, and the *mixtures* and *sequences* in which the specialist revels are also described. The author gives valuable practical advice in all sorts and conditions of operations and patients, and for reference this is most desirable, but medical men cannot and do not require to have the knowledge of experts in anæsthesia.

The work is divided into five parts—(1) "History and Experimental Physiology"; (2) "Preliminary Considerations before Administration"; (3) "The Administration"; (4) "Management and Treatment of Difficulties, etc."; (5) "The Condition of the Patient after Administration." These different parts are considered very fully and in much detail, and it is quite impossible, in a short review, to do justice to the excellence of the painstaking work Dr. Hewitt has done. Naturally some of it is open to criticism, and opinions must vary regarding some statements. Regarding shock during anæsthesia, there seems a confusion of thought in the author's mind, and the division into circulatory, respiratory, and composite shock is unnecessary. That which he terms respiratory is apparently seen when the operation has been begun when the patient was not sufficiently under the anæsthetic. The term *light* anæsthesia appears not infrequently synonymous with imperfect anæsthesia. Shock in breast cases (p. 217) is also explicable from this point of view. The phenomena described on p. 71 are better explained by summation of stimuli than by the hypothesis of the author, who adopts rather roundabout explanations of very simple physiological facts. An inclination, indeed, to complicate simple matters by too much theory rather mars certain parts of this work, and we feel relieved when we read the more practical portions of the text. In these practical parts Dr. Hewitt is at his best; drawing upon his great experience and close observation, he gives most excellent and sound advice, and we are satisfied that those who avail themselves of this work for assistance in difficult cases will be well repaid. This edition has been brought up to date, and gives the newest information in all pertaining to anæsthetics and their administration.

Operative Gynæcology. By Howard A. Kelly, A.B., M.D. London: Sidney Appleton.

The second edition of this classic work has made its appearance after a lapse of nine years, and is to be welcomed not only in so far as the bringing up to date of the previous edition is concerned, but also from the important additional chapters which have been added on bacteriology, menstruation and its anomalies, displacements and pessaries. By these additions the work has attained the position of a complete text-book on gynæcology, and must therefore be increasingly useful to the medical profession generally. Its designation, "Operative Gynæcology," gives only a partial conception of its contents, and might with benefit be changed.

Much has been added to the operative treatment of relaxed vaginal outlet and prolapsus uteri, but no mention is made of the triangular denudation of the vaginal wall which in practice is as good as, if not better than, the oval method. The use of silkworm gut for suturing in these cases seems doubtful, as the subsequent removal of the stitches is difficult and irksome to the patient, while the same results may be gained by chromicised catgut.

The chapter on uterine inversion has been rewritten by Dr. Dobbin, who seems to be unaware of the excellent results obtained by hysterotomy from the posterior incision when done by the abdominal route.

We are glad to see that the author considers treatment by means of pessaries still of value in suitable cases, and that the vulcanite variety is strongly recommended in preference to the soft ring which causes such a foul and troublesome leucorrhœa. The chapter on bacteriology is an addition of great importance, and brings the work thoroughly up to date.

The subject of exploration of the bladder and ureters, of which the author may be said to be the pioneer, is without doubt of the most outstanding merit, and the same may be said of the various abdominal operations, particularly hysterectomy for fibroids, which is detailed in an incomparable manner.

Over sixty pages are devoted to the subject of ectopic pregnancy, all of which are interesting and to the point. One cannot, however, share with the author the difficulty of understanding "external migration of the ovum," when we have before us the theory of the serous intraperitoneal stream induced by the fimbriæ of the healthy tube floating the ovum into its lumen.

We are glad to see the author strongly protests against insanity forming a special sequela to gynæcological operations, and rightly suggests that the pelvic disease may be an exciting cause of mental aberrations, and may be cured by treatment of the pelvic condition. Epilepsy particularly may in certain cases owe its origin to pelvic pathological conditions and be cured by their treatment.

The work before us is, without doubt, the best on the subject in the English language, and one doubts if there is a finer treatise in any other language. The illustrations are not only numerous (704), but better than any we have elsewhere seen. As a whole, the work is, and will remain, a lasting monument to its author, whose name has become almost a household word to the medical profession at large.

Manual of Anatomy, Systematic and Practical, including Embryology.
By A. M. BUCHANAN. Vol. i. "Osteology and Upper Limb, Lower Limb." London: Baillière, Tindall, & Cox.

THIS manual affords an example of an attempt to combine in one book a systematic treatise and a manual of practical anatomy. Dr. Buchanan begins with an account of the bones of the human body, carried out in a systematic way, and similar to the section dealing with osteology which is found in any of the larger text-books of anatomy. There is no doubt that a thorough knowledge of osteology is the soundest foundation that a student of anatomy can lay, and it may be a help to the student to have this section conveniently at hand for reference while he is dissecting. The advantage, however, would have been increased had the section dealing with the skull been carried into the volume in which the soft tissues of the head and neck are described.

Following this section is the text dealing with the regional anatomy of the upper and lower limbs, and at the end of the description of each limb are found the instructions for dissection. There is not much scope for originality of treatment in describing the anatomy of the limbs, and we do not look for it in a manual of this kind. It can be said, however, that the descriptions are throughout complete and clearly written.

The illustrations, on the whole, are good, but not free from error: thus on page 453 the anastomotica magna artery is represented as being the direct continuation in direction and size of the femoral artery. This first volume may be said to fulfil the promise of the author, and furnishes a complete treatise of the anatomy of the limbs and of osteology.

A Manual of Diseases of the Eye. By CHARLES H. MAY and CLAUD WORTH. London: Baillière, Tindall, & Cox.

THE student of general medicine who wishes to read a short and easily followed statement of the principles and fundamental facts of ophthalmology, will find in this profusely and beautifully illustrated handbook a very pleasing and readable introductory work.

To the junior student good illustrations are a very great advantage; and in this book they certainly justify the large amount of space which is devoted to them, though in 400 pages there is not much room to spare in dealing with the subject in hand.

When, as occasionally happens, matter for adverse criticism comes under notice, such is usually found in the text rather than in the illustrations. This is, however, not always so. The illustration showing delivery of the lens in the operation for extraction of cataract, shows this important part of the operation in process with the speculum in position, and the fixation forceps still holding the conjunctiva. In the description the operator is very properly advised to remove from the eye both the speculum and fixation forceps before proceeding to the delivery of the lens, but this wise advice is not supported by the illustration. In some instances important practical matters are not set forth in as complete and satisfactory a manner as might have been expected from the aim and general standard of the book. A work of this size, which deals with the subject of ophthalmology as a whole, cannot do so in other than a somewhat curtailed and incomplete way.

The general arrangement is very good. The chapters beginning with the examination of the eye continue the usual sequence of subjects, many of the chapters giving a most excellent account of the subject dealt with.

On the whole, this book will prove very attractive and quite satisfactory as a guide for beginners.

Atlas of Typical Operations in Surgery. By Dr. PH. BOCKENHEIMER and Dr. FRITZ FROHSE; adapted English Version by J. HOWELL EVANS, F.R.C.S. Eng., Demonstrator of Operative Surgery at St. George's Hospital, London. London: Rebman Limited.

THIS large work on Operative Surgery is remarkable for the completeness with which the steps of different operations are illustrated. There are sixty plates in all, and in the case of important operations there are as many as three to five plates devoted to each; they have been made from original drawings, and are printed in colours on very thick paper.

The methods of operation selected for illustration are described as typical, and this contention holds good in the majority of the operations described.

There are, firstly, three plates illustrating tracheotomy; we do not like the spelling "thyreoid," and it is unusual to figure the inferior thyroid veins as arising above and superficial to the isthmus of the thyroid. The two plates which illustrate hemicraniotomy demonstrate the operation in which a large flap is raised from over the motor areas.

Five plates are devoted to the operation for inguinal hernia; in addition to the dissection of the inguinal canal, the scrotum is displayed as being laid open right down to its lower end, which, while instructive from the anatomical standpoint, is beyond anything that would be called for in the living subject. The ligation of the lingual artery is shown at the seat of election, and is a beautiful demonstration of the anatomy of the parts exposed in this dissection.

Excision of the tongue, which is shown in detail in five plates, is carried out by von Bergmann's method, in which the incision is carried from the angle of the mouth right outwards into the cheek, and then downwards at a right angle to the hyoid bone; the jaw is divided at the junction of the horizontal and ascending rami. There is no doubt that the operation is a very thorough one, and gives better access to the lymphatic glands on that side exposed by the operation, and is therefore probably to be preferred to Syme's method, in cases where the cancer is limited to one side.

Gastrostomy has one plate, showing the method usually associated with the name of Frank, but here said to be that introduced by von Bergmann. The plate is a very good one, but the diverticulum of stomach which is pulled through the tunnel in the parietes exceeds in length by a long way what is possible in the contracted stomach which accompanies stricture of the gullet.

There is no more successful series in the Atlas than the five plates which illustrate excision of the larynx; the reader is enabled to see at a glance the various steps, and at each step the important structures which he encounters in the course of this operation.

With regard to the Appendix, the only operation figured is for the removal of this structure in the interval between two attacks, and the incision recommended is an oblique one at the outer border of the rectus, although the plate shows the typical M'Burney procedure.

Femoral hernia has two very successful plates, one of these showing a Roux' staple *in situ*, the other the closure of the canal by a flap turned down from the external oblique, and stitched to the fascia covering the pectineus muscle.

There are a series of plates illustrating a dissection in the male perineum with a view to performing external urethrotomy, or prostatectomy. The prostate and the parts round it are shown more diagrammatically than is done in other parts of the Atlas.

The other operations illustrated are suprapubic cystotomy, laminectomy, the various operations on the stomach and intestines, on the biliary passages, on the thyroid, œsophagus, breast, and Gasserian ganglion.

The English translation is on the whole satisfactorily performed, but here and there the construction of sentences leaves a good deal to be desired. We might instance that on page 43, in concluding the description of cancer of the tongue, "A radical operation is quite justifiable, because recurrence is frequently early even after free removal and primary healing."

Hand-Atlas of Human Anatomy. By WERNER SPALTEHOLZ, Extraordinary Professor of Anatomy in the University at Leipzig. Edited and Translated from the Fourth German Edition, by LLEWELLYS F. BARKER, Professor of the Principles and Practice of Medicine, Johns Hopkins University; with a Preface by FRANKLIN P. MALL, Professor of Anatomy in the Johns Hopkins University. Second Edition in English. Philadelphia and London: J. B. Lippincott Company.

THE very favourable opinion which we expressed of the first edition of this work has been amply borne out by more intimate acquaintance with it, and we are therefore not surprised that the first edition has been exhausted. As an atlas of anatomy it is unsurpassed, the accuracy and artistic perfection of the plates being very prominent features.

In vol. i., which is concerned with the bones and joints, these structures are very finely reproduced in shaded black and white drawings, the muscular attachments are indicated by the usual coloured lines, and there is a series of beautiful plates illustrating the appearance of ground sections of bone. The only important omission we have noticed is that of the *os trigonum tarsi*, which is neither mentioned or illustrated. The relationships of the synovial membrane to the epiphyses are very successfully illustrated, and many of the joint sacs and the bursæ have been distended with a stiffening medium previous to dissection. In the second volume, the plates illustrating the muscles and fasciæ are of the best possible workmanship, and they are all original except a few sections and diagrams taken from the well-known works of Merkel, Krehl, and Braune.

The blood vessels, nerves, and viscera are dealt with in the remaining portion of the work, and we can only repeat what we have said of the others, that they are of the highest excellence. Colours have been freely used to bring out the individual structures to even a greater extent than in the first edition.

With regard to the text, this is only intended to explain the plates, and amply suffices for this purpose. Many of the technical terms will be new to British readers, but as they have the high authority of the Anatomical Association, and are for the most part duplicated in Latin, there is every inducement for the British reader to become acquainted with them. It is, of course, a little confusing that the "serratus magnus," for example, should be called the "serratus anterior," but there can be no question of the advantage of employing terms which are used by all nations throughout the world. It is also a little confusing at first to read of "median-ward" and "lateral-ward" in place of "inwards" and "outwards," but it is the literal translation of what German authors have been always in the habit of using.

Medical Electricity. By H. LEWIS JONES, M.A., M.D. Fifth Edition. London: H. K. Lewis.

THE new edition of Dr. Lewis Jones' "Medical Electricity" fully maintains its reputation.

In the subject of which he treats, progress has of late years been very rapid, and many alterations have necessarily been called for in the book. These changes have been skilfully made, and the work has not lost the sense of proportion and balance which were so characteristic of its earlier editions. It is primarily written for those whose knowledge of electricity is small, and the author has always been careful to give full and simple explanations of all the problems which are likely to present themselves to those who are practical workers in this field of medicine.

The first section of the book, which relates in large measure to apparatus, is perhaps unduly long, whilst some of the illustrations are scarcely worth the space they occupy, and would be more suitable for an instrument maker's plates. They may, however, be of some use in indicating the forms which are most likely to be serviceable to ordinary practitioners.

The second section deals with treatment, and is much the more valuable part of the book. The wide experience of the author enables him to speak authoritatively on many matters which are now being freely discussed, and many of his readers will be interested in his views on such subjects as the application of high frequency to various diseases, and in the treatment of rodent ulcer by zinc ions.

For the ordinary requirements of general practice, it would be difficult to find a better book on medical electricity, and this revised edition may be confidently recommended as clear, sufficiently full, and thoroughly accurate.

An Introduction to Physiology. By WILLIAM TOWNSEND PORTER, M.D. Philadelphia and London: J. B. Lippincott Company.

THE second edition of this well-known volume has been considerably enlarged. It is the outcome of the "concentration" system which is in practice in some of the American Universities, where the student devotes all his time and energy to one subject for a stated period of his course. The book is designed in the first place for the use of medical students at Harvard, but it will prove of more general use, especially where the "concentration" system is in vogue. It deals with the practical side, and is a collection of fundamental and accessory experiments in a large part of experimental and chemical physiology. A valuable feature of the book is the reference in a footnote to the original source of each experiment.

The material contained is too large and the experiments too numerous for the average student to overtake in a practical course, unless he has nothing but physiology to attend to. For advanced students, however, and even for the junior student to read over without actually doing all the experiments, the description of the practical work is combined with sufficient theory for the ready understanding and appreciation of it. For teachers of practical physiology the book is a valuable one, and all will welcome the appearance of the author's "Laboratory Text-Book," of which the present volume is an abbreviated and limited form.

The Chemical Investigation of Gastric and Intestinal Diseases by the Aid of Test Meals. By VAUGHAN HARLEY and FRANCIS W. GOODBODY. London: Edward Arnold.

IN this book, which is intended for practical use, the authors give a short account of the methods for the chemical examination of gastric contents and fæces, and of the chemical symptoms which accompany the various diseases of the stomach and of the intestines. The authors have limited themselves to a description of those methods which they have themselves employed and found to be trustworthy. In the same way they have refrained from giving the numerous and very often conflicting results which have been obtained by other observers, and have preferred to give mainly an account of those chemical symptoms which in their own practical experience have proved to be of special significance. This wise restraint has enabled them to give us a reliable and useful little book.

The book is divided into two parts: the first part deals with gastric diseases, the second part treats of diseases of the intestine. The discussion of the chemical symptoms of the various clinical conditions is preceded by a description of the chemical methods. These chapters might have been given with advantage in greater detail. The somewhat summary account especially of some of the quantitative methods is hardly a sufficient guide except for those who are accustomed to chemical methods. The Index, too, should be more detailed for a book of this kind.

These little defects, however, cannot detract from the value of the book, which will be found a useful help in scientific clinical work.

NOTES ON BOOKS.

Simple Introductory Lessons in Midwifery (The Scientific Press, London) is a concise little book, designed for the use of women who desire to pass the Central Midwives' Board Examination. The meaning and derivation of all technical words are explained in the text.

The treatment of nævi, moles, warts, redundant hairs, and so forth by means of electrolysis, is briefly described by Dr. M'Latchie in *Electrolysis in the Treatment of Facial and other Blemishes.* This useful pamphlet is published by Glaisher, London.

Under the title of *Consumption: Treatment at Home and Rules for Living* (Wright & Co., Bristol), Dr. Warren Crowe sets forth the rules which should guide a consumptive patient in regard to eating, exercise, rest, ventilation, and thermometry. It is suggested that if the doctor were to give this booklet to the patients under his care, it would be of material assistance in educating them as to the elementary principles of treatment which are essential for the cure of the disease.

A Vocabulary of Malay Medical Terms has been compiled by Dr. P. N. Gerrard. The vocabulary, which is a remarkably extensive one, and is published by Kelly & Walsh, Singapore, should be of great service to those who are engaged in medical practice in the Malay Peninsula and Archipelago.

The eleventh volume of the *Zeitschrift fur angewandte Mikroskopie und klinische Chemie* (Hygienischer Verlag, Leipzig) contains many interesting articles. Among others we note those on ultramicroscopic vision, by G. Marpmann, the learned editor of the journal; on the fixation of diatoms; on the detection of copper in preserved vegetables; on *Tieghemella japonica*, a new species of mould found in Japan; and on the preparation of an active serum against scarlatina. The abstracts on new laboratory methods, clinical chemistry, mycology, and applied microscopy are numerous, and should be of service to those who are interested in such subjects.

From the pen of Dr. R. W. Marsden comes a work entitled *Hints on the Management of the Commoner Infections* (Heinemann, London). It deals with the general measures to be adopted in acute infective diseases, and with the principles of treatment which should be carried out in the various specific infections. The text has been carefully written, and contains those details of treatment concerning which nearly every graduate commencing the practice of his profession requires information.

Dr. William Berry presents, in the form of a booklet, *Lectures to Teachers on the Prevention of Infectious Diseases* (Wright & Co., Bristol), the lectures he recently delivered at the request of the Education Committee of the Wigan County Borough Council. The work deserves to be widely read by teachers in elementary and secondary schools.

As a guide to the man who proposes to take one or more trips as a ship-surgeon, we can confidently advise a perusal of Dr. Vavasour Elder's book, *The Ship-Surgeon's Handbook* (Baillière, London). The text bears every impress of being from the pen of one who is well qualified by personal experience to write on the duties which may fall to the lot of the surgeon on board ship. The choice of a ship, outfit, status and duties on board, and the special points which demand attention in the treatment of passengers, are in turn discussed. The author describes the curious cravings for certain articles of food which passengers may develop while in the throes of sea-sickness. Some of his patients have expressed a desire for cold pork and chutney, others for lobster salad, and steak and onions. The last part of the book, dealing with ships as convalescent institutions, will be read with interest and benefit by practitioners on land, who are often sadly ignorant as to the type of case which may be expected to derive benefit from a sea voyage.

A fifth edition has appeared of this useful little book—*Retinoscopy, or the Shadow Test*, by James Thorington (Rebman, London)—which has made a place for itself in the esteem of those who practise retinoscopy. It is the fashion in some quarters to decry retinoscopy: one says it is not at all scientifically precise, another that it attempts greater precision than it can achieve, but in the hands of those who know how to use it, it has no rival. Thorington's actual method of employment is not much in favour in this country, for he moves forward the light till it is close to the mirror: we are not aware that any British surgeon practises this method, though there may be; but that is a minor point. His description of the details of retinoscopy is clear, and his illustrations are illuminating.

In his *Clinical Studies of the Treatment of the Nutritional Disorders of Infancy* (Baillière, Tindall, & Cox, London), Dr. Ralph Vincent publishes what is virtually a supplement to his book *The Nutrition of the Infant.* Consisting entirely of case records of infantile malnutrition, it will prove a guide to those who have the desire and opportunity of employing milk prescriptions filled at a laboratory instead of the simpler methods of home modification.

Dr. Gee's *Auscultation and Percussion* (Smith, Elder, & Co., London), of which the fifth edition lies before us, is so well and favourably known to the profession that to criticise it is unnecessary, and would even be impertinent. It is enough to say that, within small compass, the student will find an authoritative exposition of the fundamental facts of physical diagnosis, which he is too apt to estimate lightly in comparison with those which are more complicated and attractive. We should like to see Dr. Gee's book even more widely used than it is at present.

Dr. Ash in this little book—*Hypnotism and Suggestion* (J. Jacobs, London)—undertakes no detailed argument of the theories and problems of hypnotism. It aims rather at being a plain statement of how best the hypnotic state may be induced in the individual by any intelligent person. His method is precisely detailed, the various phases of an hypnotic trance described, and an account given of the condition of the hypnotised person. Any one wishing to practise hypnotism will find his instructions an excellent guide, though very little is said as to the more suitable morbid conditions for which hypnotism might be of use.

With the appearance of this revised and enlarged edition of *Outlines of the Diseases of Women*, by John Phillips, M.D. (Fourth Edition, revised and enlarged. (Griffin & Co., London), we have a work on gynæcology, the outstanding feature of which is the conciseness of the information it contains. It includes a reference to the operation of ventro-suspension and chorion-epithelioma. No attempt is made to go into details regarding major operations. The appendix contains an account of the advisability of making a local examination, which should be a help to junior practitioners. The book will be found a valuable and up-to-date contribution to gynæcological literature.

In this book—*Midwifery for Nurses*, by H. R. Andrews, M.D. (E. Arnold, London)—we have the lectures delivered by the author to the pupil midwives at the London Hospital. He states that he has tried to make it as practical as possible, without adding anything that is unnecessary for the midwife to know. In this he has been fairly successful, although in some instances he goes into greater detail than is necessary for the average obstetric nurse. We think, for example, it is expecting too much when we ask the nurse to undertake the obstetric manipulations associated with a difficult breach case. We agree with the author in recommending that a trained midwife should have an intelligent idea of how to detect the presence of albumin in the urine. The chapters on obstetrical diagnosis, antiseptics in midwifery, and artificial feeding of infants, are all well written. The illustrations are clear, and the book is got up in a concise form. The last chapter contains the rules of the Central Midwife's Board, which will be found of great service to those presenting themselves for examination.

It has long been observed, both by patients and physicians, that acne and acne rosacea were liable to periodical exacerbations in women, prior to or coincident with the menstrual flux, and that hypertrichosis was apt to assert itself after the menopause, but that the influence of this systemic disturbance was so far-reaching as it is, has not hitherto been sufficiently recognised. Dr. Bulkley, in *The Influence of the Menstrual Function on Certain Diseases of the Skin* (Rebman, London), from his own recorded notes, and from a careful collation of the statements of others, has shown how many cutaneous disorders are affected in this way. The theories explanatory of the connection are clearly stated, the salient points of each being duly emphasised, but no excessive stress is laid on any of the three, which, it is admitted, combine, though possibly in unequal proportions, to produce their effects. The little volume is one well deserving of perusal. It is, like all Dr. Bulkley's writings, characterised by sound judgment, is calculated to encourage thought, and having read it, one is conscious that the time has been well spent, and that something of practical utility has been learned.

We have before us a new *Students' Handbook of Operative Surgery*, by William Ireland de C. Wheeler of Dublin (Baillière, Tindall, & Cox, London, 1906), intended principally for the guidance of those who are practising surgery on the cadaver. It is arranged on the usual plan of such works, and differs but little from other handbooks already available. The operations described have been well selected, and are, as a rule, those performed at the present day. The descriptions are brief yet complete, and they are clearly expressed, while the illustrations are admirably calculated to elucidate the text. It is to be regretted that in so many of the suprapubic and inguinal operations the incisions are depicted as being made among the pubic hair. Even in the cadaver it is an advantage to shave the part before operation.

RECENT ADVANCES IN MEDICAL SCIENCE.

MEDICINE.

UNDER THE CHARGE OF

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Diseases of the Blood.

Leukæmia without leukæmic blood.—Under this title, Ewald (*Berl. klin. Wchnschr.*, 1906, June 25) reports an unusual case. The patient was a male, æt. 37, always healthy until present illness, which began seven weeks before admission, with rheumatic pains, chills, and languor. He was anæmic and greatly emaciated; there were a few râles over the back of the chest, and soft functional murmurs. The inguinal glands were enlarged, and the spleen was palpable a finger's breadth below the costal margin. There was irregular pyrexia, and a few retinal hæmorrhages were present. Otherwise the examination was negative; the patient died in a week's time with evidence of pneumonia. During the whole of the week the patient was in hospital the blood was examined almost daily, because, clinically, the appearance suggested acute leukæmia. The average count was 740,000 red cells, 28 per cent. of hæmoglobin, and 900 leucocytes, with a differential count of 71 per cent. of polynuclears, 2 per cent. of large lymphocytes, and 21 per cent. of small lymphocytes. During life the diagnosis gave rise to much discussion. Severe anæmia from internal hæmorrhage was negatived, because no evidence of loss of blood existed. Acute miliary tuberculosis was discarded from the absence of bacilli in the sputum. Pernicious anæmia was rendered improbable by the appearance of the blood, the splenic enlargement, and the emaciation. There was no definite proof of sepsis, and leukæmia also seemed excluded by the blood examination. Eventually an acute pseudo-leukæmia or splenic anæmia was considered the most probable malady. On post-mortem examination the microscopic appearances characteristic of leukæmia were found. All the organs showed the usual cellular infiltration, and the marrow the characteristic myeloid change. In his discussion of the case, Ewald recalls the fact that an intercurrent affection may cause the leukæmic blood to return to normal for the time being; in the case in question, however, the blood had been pronounced normal at Litten's clinique in the earlier part of the illness, so that it is not probable that this was a chronic case masked by an acute infection of any kind. It seems most closely allied to the atypical leukæmias of which Hirschfeld and Alexander have described several. It was not an aplastic anæmia, for the marrow showed no sign either of aplasia or atrophic degeneration. In concluding, Ewald raises the question whether it is right to call a case leukæmia, however definite the pathological findings may be, when the blood gives none of the usual evidences of the disease.

A somewhat analogous case is reported as *acute myeloid leukæmia* by Mager and Sternberg (*Wien. klin. Wchnschr.*, 1906, No. 49). The patient was a woman, æt. 37, and the total duration of her illness, which resembled an acute infection, was twenty-seven days. There was moderate enlargement of the spleen, liver, and glands, and a hæmorrhagic rash. The blood was examined several times, and showed no great abnormality during life. Three days before death the count was, red corpuscles, 3,241,000; leucocytes, 3200; hæmoglobin, 40 per cent. No nucleated reds or myelocytes; polynuclears, 81 per cent.; lymphocytes, 19 per cent. The clinical diagnosis lay between typhoid (excluded by negative Widal), some hæmorrhagic disease, and sepsis; the probabilities favoured acute pseudo-leukæmia. As in Ewald's case, the microscopic examination of liver, glands, spleen, and marrow afforded indisputable signs of myeloid leukæmia. It was also found that in smears of the heart blood there was a decided leucocytosis, with 21 per cent. of myelocytes. This state of matters was not present three days before death. The case agrees with other reported ones in the slight leucocytosis and the absence of eosinophiles and mast cells.

Multiple myeloma and lymphatic leukæmia.—Gluzinski and Reichenstein (*Wien. klin. Wchnschr.*, 1906, No. 12) record a remarkable case of multiple myeloma in which lymphatic leukæmia developed. The patient had swellings of the ribs and other evidences of tumour formation, along with Bence Jones albumosuria, so that the diagnosis of myeloma presented no difficulty. At first the blood was comparatively normal, there being only a slight fall in the red corpuscles. Towards the end, anæmia became a marked feature, the reds falling to 680,000, and the whites rising to 39,000. There were many normoblasts, and 91 per cent. of the total leucocytes were lymphocytes. Post-mortem, multiple myelomata involving many bones were found, and a lymphocytic condition of the bone marrow where tumours were not present. The lymphocytes in the circulating blood differed in certain respects from those commonly found in lymphatic leukæmia. They were what are described by Türck as *reizungs-formen*, and by Pappenheim as plasma cells, hence the writers call their case leukæmia lymphatica plasma cellularis.

Findlay (*Glasgow Med. Journ.*, 1906, November) describes another form of atypical leukæmia—mixed cell leukæmia. The patient was a boy, æt. 11, who died after an illness lasting about seven weeks, during which progressive anæmia, a hæmorrhagic eruption, fever, and glandular, but not splenic, enlargement, were the chief symptoms. *Blood.*—Red corpuscles, 1,500,000; hæmoglobin, 15 per cent.; leucocytes, 40,000, consisting of 2·8 per cent. of polynuclear neutrophiles, 60·4 per cent. of myelocytes, 0·2 per cent. of eosinophiles, 24·9 per cent. of small lymphocytes, and 11·7 per cent. of large lymphocytes. This was with triacid stain; with Jenner the count was 3·4 per cent. of polynuclears, 39 per cent. of myelocytes, 0·2 per cent. of basophiles, 0·4 per cent. of eosinophiles, 22 per cent. of small lymphocytes, and 35 per cent. of large lymphocytes. Findlay describes the microscopic findings somewhat fully, and the main point which emerges is that there were a great number of large mononuclear cells which, when stained with triacid showed traces of granulation; when stained with Jenner, a faintly basophile protoplasm. On the one hand they shaded off into typical neutrophile myelocytes; on the other, into typical large lymphocytes. The changes in the organs were those of leukæmia. The marrow was pale, it showed great leucoblastic proliferation, the fat being almost wholly replaced by a leucocyte tissue. In many cells no granules could be detected, but from their character they were probably myelocytes. Eosinophiles were more abundant than in the peripheral blood. The case, then, showed a great absolute increase of both granular and non-granular leucocytes. Most of the non-granular cells present were probably embryonic myelocytes. Apart from this, there were also both an absolute increase of lymphocytes and lymphocytic hyperplasia of the glands. Findlay, therefore, believes that his case showed evidence both of myeloid and of adenoid hyperplasia. Discussing the suggestion that leukæmia should be classified as lymphocytic, myelocytic, and mixed, the author thinks that in most cases of so-called mixed cell leukæmia the unusual blood picture is due to the appearance of a non-granular embryonic myelocyte in a severe case of the myelocytic form; while a few may be lymphocytic cases in which the lymphocytic infiltration of the marrow has caused myelocytes to be extruded into the peripheral circulation. He does not think that the unusual blood findings in his case were due wholly to the appearance of undifferentiated leucoblasts; he supposes that the lymphocytic increase may have been due to the infiltration of the glands with myelocytes.

Leukanæmia.—A paper on this rare condition by Hurter (*Liverpool Med. Chir. Journ.*, 1907, January) deals with the case of a youth, æt. 17, who for six months had been steadily becoming more anæmic. His blood showed 508,200 red cells, 15 per cent. of hæmoglobin, and 6000 leucocytes; the colour index was 1·5. Differential counts gave about 6 per cent. of myelocytes, and 14,000 nucleated red corpuscles, almost all of them megaloblasts, per cmm. Otherwise there was little to note; the spleen, glands, and bones were normal; the gums were spongy; there was a leukæmic retinitis. No Bence Jones albumosuria. The patient was treated by X-rays applied to the spine, thorax, and long bones; he took arsenic, iron, extract of bone marrow, and various intestinal antiseptics, but without any benefit. His temperature rose, he suffered much from epistaxis, and gradually the spleen became palpable. Death occurred in about eight months from the onset. During the last three weeks of life a marked change took place in the blood, acute leukanæmia supervening; the leucocytes rose to 290,000 per cmm. During this period there were 25 per cent. of myelocytes, but eosinophiles were scanty, sometimes absent. In the later stages many non-granular myelocytes were found. These Hurter accepts as undifferentiated leucoblasts, stating that they are the same as the large lymphocytes of lymphatic leukæmia. In the earlier days of the illness the erythrocyte formations were embryonic; towards the end there appeared on the white cell side indications of a more and more complete reversion to the ancestral condition. The mononuclear cell now tends to predominate in what has been called a mixed-celled leukæmia. Had death been postponed long enough to allow this loss of differentiation to continue, lymphatic leukæmia might have resulted. During the first three weeks the case was undoubtedly pernicious anæmia; during the terminal stage the myelocytosis was consistent with leukæmia. The result of the combination of the two is known as leukanæmia. There was no post-mortem.

Aplastic anæmia (Lavensen, *Am. Journ. Med. Sc.*, Phila., 1907, January).—The clinical history of the case was that of ordinary pernicious anæmia, with a blood count of 800,000 reds, 2560 whites, 10 per cent. of hæmoglobin, and a colour index of 0·62. There were 67 per cent. of lymphocytes, 27 per cent. of polynuclears, 0·4 per cent. of eosinophiles, and 3·5 per cent. of large mononuclears. No myelocytes, no microcytes, no megaloblasts, and only one normoblast could be detected, despite frequent examinations. Death took place within three months of the onset. On post-mortem, besides the usual evidences of anæmia, the marrow of the ribs, and of the epiphysis and diaphysis of the tibia was uniformly fatty and extremely pale. Microscopically, there was the usual fatty degeneration of the viscera, iron deposit in the liver, and in the marrow abundance of fat, very few normoblasts, no megaloblasts, a few myelocytes, and a moderate number of lymphocytes; no polynuclears could be identified. Lavensen gives a résumé of ten reported cases, which correspond closely with this. The blood is therefore sufficiently characteristic — profound reduction in hæmoglobin, a rather slighter fall of reds, few or no normoblasts, no megaloblasts, leucopenia with relative lymphocytosis. The characteristic post-mortem appearance is the pale fatty condition of the marrow, affording no evidence of any attempt at blood regeneration. Lavensen argues that aplastic anæmia is a variety of pernicious anæmia, and that the differences between them are due exclusively to the absence of regenerative processes in the former. The blood picture in aplastic anæmia results from (*a*) hæmocytolysis and (*b*) failure of regeneration. Failure of regeneration results from one of the three following: (*a*) simple deficiency of regenerative power; (*b*) inhibition of marrow by the hæmolysing factor; (*c*) a true aplasia. If there be true aplasia it is probably of recent origin. The fact that, despite the inactivity of the marrow, the lymphocytes are relatively abundant, shows that these cells are not a specific product of the marrow.

SURGERY.

UNDER THE CHARGE OF

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On Impermeable, Non-Cancerous Stricture of the Œsophagus.

It must be admitted that the treatment of impermeable stricture of the œsophagus has hitherto left much to be desired. The use of the electric œsophagoscope, however, seems to promise more satisfactory results. Gross and Sencert (*Rev. de chir.*, Paris, 1907, January) contribute an interesting paper on the subject, based on a recent experience of seven cases. The first case was one of congenital stenosis in a child, æt. 12. With the œsophagoscope the obstruction was found to be 20 cms. from the teeth, and to take the form of a diaphragm stretching across the tube, with a small circular aperture (3 to 4 mm. in diameter) a little to the left side. The mucous membrane was normal, showing no sign of ulceration or of cicatricial contraction. The diaphragm was very thin, and a stilette passed through the orifice reached the stomach. At a subsequent sitting the diaphragm was divided by radiating incisions with the aid of the œsophagoscope, and the orifice was gradually dilated with bougies until the normal lumen was restored, and the child left the hospital cured.

A similar case is reported by M. Guisez (*Gaz. d. hôp.*, Paris, 1906, December 27) in a patient, æt. 19. All forms of treatment, including gastrostomy, had been employed. With the œsophagoscope Guisez found an obstruction in the lower third of the gullet, 33 cms. from the teeth. It was like a valve, with an eccentric opening, and the œsophagus was distended into a pouch just above the orifice. Internal œsophagotomy was performed, the orifice gradually dilated, and the patient recovered completely, being able to eat ordinary food. The gastrostomy wound was allowed to close. The author recommends that a bougie should be passed periodically to prevent cicatricial contraction.

Gross and Sencert had one case of spasmodic stricture of the cardia, above which was a fusiform dilatation of the œsophagus. No organic lesion was discoverable. A bougie was passed into the stomach with some difficulty. The same night the patient was able to swallow some food. Their other five cases were examples of cicatricial stenosis. In three of them, dilatation with bougies, with the aid of the œsophagoscope, resulted in cure. In the other two, linear electrolysis of the obstruction was performed. One was successful; in the other the patient died.

The authors speak very highly of the value of the œsophagoscope, both for purposes of diagnosis and as an aid to accurate and definite treatment of the obstructing factor, either by bougies, incision, or electrolysis.

RESECTION OF THE THORAX FOR CHRONIC EMPYEMA.

THE Estlander and Schede procedures for the obliteration of empyemic cavities are severe operations, particularly in view of the low condition of the patients for whom they are appropriate. Carl Bayer of Prague (*Centralbl. f. Chir.*, Leipzig, 1907, January 5) suggests a procedure which seems to have certain advantages. This surgeon points out that there is an anatomical line in the thorax, about two fingers'-breadth behind the anterior axillary line, in which an incision that will expose all the ribs from the third to the tenth, close to the digitations of the serratus magnus, can be made without dividing any muscles, except a few fibres of the external oblique, or any blood vessels of importance. Having made this incision, each rib is resected to the length of about three-quarters of an inch, and in the groove thus formed the soft parts, including the thickened parietal pleura, are divided with the thermo-cautery. After the contents of the cavity have escaped, the edges of the wound are drawn aside, and the extent of the cavity determined. Each rib can now be shelled out, both in a forward and in a backward direction, with remarkable ease. This step is rendered even more easy if a second incision is carried across the chest at right angles to the lower end of the original one. If the wound is held well open, all the ribs can be removed as far back as their angles, and as far forward as their junctions with the cartilage. If the anterior wall of soft parts is now yielding, it falls down of itself, and obliterates the cavity; if not, the parietal pleura may be scraped, or transverse incisions may be made in it. It is only in tuberculous cases that the parietal pleura should be removed. The conservation of all the soft parts of the thorax diminishes very considerably the resulting deformity.

PROSTATECTOMY IN DIABETES.

WEINER (*Med. Rec.*, N.Y., 1906, December 15) believes that coma following operations in diabetic patients is a danger rather of the anæsthetic than of the operation itself, and that we need not fear this complication if the prostate is removed quickly under nitrous oxide anæsthesia, or, better still, if the operation is done in two stages, namely, by opening the bladder suprapubically under local anæsthesia, and then after a few days completing the operation by removing the prostate under nitrous oxide. If the operation is performed at one sitting, then the anæsthetist may stop giving gas as soon as the bladder is opened, *i.e.* in from three to five minutes. During the actual shelling out of the prostate, it is not necessary for the patient to be fully anæsthetised.

Regarding the danger of wound infection in diabetes, this can be reduced to a minimum by the preliminary incision and drainage of the bladder for a few days, combined with the administration of urinary antiseptics both before and after the operation, accompanied by frequent irrigation.

The author has had considerable success by these means, and does not now consider diabetes a contra-indication to prostatectomy.

Double Perforation of Ileum and Perforation of Gall Bladder in Typhoid.

A case illustrating this unique combination of lesions is reported by Keliani (*Ann. Surg.*, Phila., 1907, January). The patient was a man, æt. 40, suffering from the ambulatory form of typhoid, probably about the end of the fourth week of the disease. Eleven hours after the patient was admitted to hospital he became seriously ill, perforation was diagnosed, and the abdomen opened. Two perforations were found in the ileum, close to the ileo-cæcal valve, and sutured. The fundus of the gall bladder was found to be gangrenous, and two small perforations had formed. There were two gall stones in the gall bladder. Cholecystectomy was performed. The patient died twenty-one days after the operation, of gangrene of the lungs and empyema—both probably of tuberculous origin.

OBSTETRICS AND GYNÆCOLOGY.

UNDER THE CHARGE OF

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Hæmorrhages in Pregnancy due to Changes in the Decidua Reflexa.

Mendels (*Centralbl. f. Gynäk*, Leipzig, 1906, October 20) refers to the generally accepted view that the decidua reflexa after the sixth month becomes thinner till it almost disappears, leaving the decidua vera and chorion in direct contact. But from the examination of a large number of placentæ, Mendels believes that this does not always occur, and that a small portion of the decidua reflexa may persist between the chorion and decidua vera. During the early months of pregnancy the decidua may also disappear, with hæmorrhage as a result. In cases of hæmorrhage from anomaly of the decidua reflexa, there are no other symptoms of abortion. The fœtus is always alive, the hæmorrhage begins early in pregnancy, and severe anæmia may result. Mendels thinks that such a degree of anæmia justifies the artificial interruption of pregnancy.

Retention of the Membranes.

Rissmann (*Monatschr. f. Geburtsh. u. Gynaek.*, Berlin, 1906, November) refers to the importance of complete removal of the secundines after labour. This may frequently be ensured by firm pressure on the uterus. When twenty-four hours have elapsed after labour, and the membranes are not entirely removed, this should be done instrumentally. Sepsis, subinvolution, and hæmorrhage may occur if a portion of the membranes is left in the uterus. Rissmann recommends that the uterus be massaged till contraction is satisfactory, and kept up by the pressure of a sand bag. If fragments of membrane are not thereby detached, instrumental removal becomes necessary. Retention is less frequent when the third stage is allowed to be prolonged, whereas it is frequently met with when Crede's method is employed.

Pubiotomy.

Henkel (*Ztschr. f. Geburtsh. u. Gynaek.*, Berlin, 1906, Bd. lvii. Heft 1), in contrasting this operation with symphysiotomy, mentions the following objections to the latter:—The joint being wounded where asepsis is difficult to maintain, fibrous union may occur, which may not be an advantage, as it may cause difficulty in walking. On the other hand, bony callus is occasionally formed, with consequent immobilisation of the joint. In pubiotomy the danger of hæmorrhage is less, the urethra and bladder are not so liable to be wounded, and firm union occurs with certainty. The technique of the operation is described in detail. Henkel has had seven cases, and in all the left pubic bone has been divided, irrespective of the position of the occiput. He prefers version to forceps, the patient being placed in Walcher's position. Six of the patients were able to walk during the third week after operation. The seventh died from septic infection. He mentions as possible complications, hæmorrhage from the clitoris and veins in the broad ligament, and laceration of the vagina. This last is almost certain to occur in a primipara, and in such patients the operation is contra-indicated. Pubiotomy may be performed in cases of flat pelvis with a conjugate from $3\frac{2}{5}$ to $2\frac{7}{10}$ in., but at the lower limit, provided the child is small, and in cases of generally contracted pelvis with conjugate down to 3 in., Henkel considers the operation one of great value, but only to be carried out with skilled assistance.

Successful Vaginal Cæsarean Section for Puerperal Convulsions.

Hayd (*Buffalo Med. Journ.*, vol. lxii. No. 3) reports the following case:—Primpara, æt. 23, admitted to hospital with puerperal convulsions, having had ten fits before admission. Attempts to dilate the os manually failed, owing to its rigidity. Vaginal Cæsarean section was performed in the usual way, and was unattended with any hæmorrhage. The membranes were ruptured, and forceps applied. There were two convulsions after the operation, but the patient made a satisfactory recovery.

Post-Operative Ileus.

Baisch (*Centralbl. f. Gynäk.*, Leipzig, 1906, No. 43), in reporting on sixteen cases, found adhesions as the cause, and in 72 per cent. there were firm adhesions between the pelvic organs and intestine. Where the peritoneum is free from blood, no adhesions are formed, even although a large area of serosa is separated. Hence complete hæmostasis is to be aimed at. To effect early action of the bowels, two teaspoonfuls of castor-oil are given before operation. If nothing is passed by the third day, and sickness occur, feeding by mouth must be stopped, and the stomach washed out, operation being indicated if the pulse becomes rapid and smaller. The adhesions are most frequently found on the stump or laparatomy wound. Of the sixteen cases, thirteen recovered.

MYOMATA OF THE PELVIC CONNECTIVE TISSUE.

HAGEL (*Centralbl. f. Gynäk.*, Leipzig, 1906, October 20) reports three cases of myomata of connective tissue origin, two of which were diagnosed as uterine myomata. Hagel does not consider such tumours to be very rare, and that hard, small pelvic growths may be of this nature. Those arising in the small pelvis are movable, and may be confused with ovarian tumours. The retroperitoneal position of the tumour may be made out by palpation. Such tumours are of the nature of leiomyomata.

RESULTS OF MODERN MYOMA OPERATIONS.

SARWEY (*Arch. f. Gynaek.*, Berlin, Bd. 79, Heft 2) gives his results obtained in 430 cases. In 198 cases the myoma was extirpated by the vaginal route; in 178 cases total extirpation was performed. There were 232 abdominal operations, with 149 total extirpations; and sixty-two supravaginal amputations. In 413 of the cases the patients were well in a month after operation. There were seventeen deaths, ten of which were complicated cases. In fifty-seven cases there was some form of degeneration. Sarwey thinks the rate of mortality of the modern operations may be taken to be about 4 to 5 per cent., the ventral operation giving better results than the vaginal route. Cessation of growth after the menopause is rare, and in old patients degeneration of the tumour generally occurs. The best results are obtained when the ovaries are removed with the tumour. Long palliative treatment of myomata is unjustifiable.

UTERINE MYOMATA COMPLICATING PREGNANCY.

MONTGOMERY (*Journ. Am. Med. Assoc.*, N.Y., 1906, December) states the conditions which justify interference during pregnancy as follows:—(1) Persistent abdominal pain; (2) rapid growth of the combined swellings, so that life is in danger from pressure on important organs; (3) situation of the tumour, such as to cause positive obstruction at full time; (4) indications of impending abortion or premature labour. Hysterectomy is the best operation in the interests of the mother, but as the child is sacrificed, this method should only be undertaken when there is no hope for the continuance of pregnancy. Before the fifth month enucleation may be the operation of choice, as it does not necessarily increase the tendency to expulsion of the uterine contents, and it does not unfavourably influence subsequent parturition.

Dystocia from Congenital Cystic Kidney of the Fœtus.

Lynch (*Surg. Gynec. and Obst.*, Chicago, 1906, November) reports a case of twin pregnancy presenting the unique feature of cystic kidney, and hydronephrosis of sufficient size to cause an obstacle to the birth of the first child. The patient was æt. 26, and had previously had three spontaneous labours, the oldest child being 6 years of age, the youngest 3. Both labours were normal. On examination, the pelvis was found to be normal, but the uterus was enormously distended. Per vaginam, examination showed that the cervix was completely dilated, membranes ruptured, and a foot and knee projected from the cervix. Chloroform was given, and both feet drawn down. As vigorous traction failed to accomplish descent, the fœtal body was palpated by passing a hand into the uterus, when it was found that the abdomen was of enormous size, and appeared to be filled with a cystic mass, preventing the child's body from entering the pelvis. An incision 6 cms. long was then made into the fœtal abdomen, and a nodular tumour was easily palpated.

About 470 grms. of cystic tissue was removed, which caused collapse of the abdomen. A soft cystic body presented in the wound, which yielded on puncture about a pint of clear fluid; after which the child was extracted without much difficulty. The second child was delivered without difficulty, and the mother's recovery was uncomplicated. A detailed account of the anatomical features of the fœtus, with reference to thirty-eight other published cases, is fully given in the paper.

THERAPEUTICS.

UNDER THE CHARGE OF

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Accidents following Thoracentesis.

In the great majority of cases the thoracic puncture is not attended by any risk; but in a limited number of instances accidents arise, varying in severity from transitory pleuritic urticaria to sudden collapse, resulting in more or less rapid death. Of these accidents, the most interest is attached to those in which there is albuminous expectoration, sudden death, or pneumothorax. Death may follow simple thoracic puncture without the removal of any fluid. In a number of instances it has followed the exploratory insertion of a needle into a solidified lung. In such cases probably the termination of the pneumogastric nerves are in a hypersensitive condition as the result of the inflammatory changes, and the insertion of the needle may cause an extreme reflex inhibition. Death may be immediate, or may be preceded for several hours by unconsciousness and convulsions, which arise from cerebral anæmia, as the result of the cardiac inhibition and lowered blood pressure. In another class of case, however, there is no question of direct stimulation of the terminations of the vagus nerve. Sears has seen a case of this type. A man was admitted to hospital suffering from high fever and effusion into the pleural cavity. By aspiration 64 oz. of bloody fluid was removed, but the fever remained and the fluid reaccumulated, so that at the end of three weeks it was decided to repeat the aspiration. On introducing the needle, the patient collapsed, and became cyanosed and pulseless. Despite stimulation, it was impossible to bring him round, and he died in fifteen hours. No post-mortem examination of the head was obtained; but the chest was examined, and a thick deposit of fibrin on the lung made it clear that the needle could not have entered the lung tissue. Another accident which may attend thoracentesis is pneumothorax. In a certain number of cases pneumothorax has arisen from faulty technique, whereby the aspirating pump was reversed, and air pumped directly into the pleura instead of being removed. In other cases a little air may enter through an unguarded needle, but in most cases of pneumothorax the air comes from the lungs either as the result of a tear or from the rupture of a cavity. In children, instead of pneumothorax, a condition of subcutaneous emphysema is met with. As a rule, a small pneumothorax after aspiration is overlooked; but Sears has himself seen four cases in a few months, so that probably the condition is by no means rare. It is more likely to occur in chronic than in acute cases. A proper technique will eliminate those cases in which the air is directly pumped in, or in which the entrance is through an unguarded patent needle; but in other cases we are unable to do more as a precautionary measure than to withdraw the fluid from the chest very slowly, and, above all, avoid tapping the lung tissue.—*Am. Journ. Med. Sc.*, Phila., 1906, December.

The Treatment of Pneumonia with Metallic Ferments.

The treatment with serum therapy and other specific agents have been found alike unsatisfactory, and, as a rule, the practitioner called in to treat pneumonia adopts an expectant course of treatment, and devotes himself to the relief of symptoms. According to Robin, the study of the general metabolic changes, and especially the respiratory changes, which occur at the crisis enables us to follow in part the natural course which the body adopts to defend itself against the toxin. These changes are fairly constant. At or immediately preceding the crisis the organism discharges large quantities of uric acid and urea. At the same time the coefficient of utilised nitrogen rises. These urinary phenomena are associated with respiratory changes, which show that the total quantity of oxygen used is lessened at the crisis. Now, the effect of injecting metallic ferments closely resembles this natural sequence of events in the critical period of pneumonia. They, too, increase the output of nitrogen, urea, and uric acid, while the ratio of utilised nitrogen rises coincident with a diminution in the amount of oxygen used up. Robin therefore thinks that, as these metallic substances act along the same lines as the natural resisting power of the body, they may be utilised to supplement the natural course of events. They evidently do not exert any influence upon the seat of the disease, but merely upon the toxin. By aiding the efforts of the tissues, they lead to the more rapid removal of the toxic symptoms.

The use of these metallic substances constitutes only one of the methods of treatment, and their use should be associated with the other recognised methods of symptomatic treatment, such as venesection in suitable cases, the use of calomel, alcohol, quinine, and blistering. The metallic ferments are all similar in action. It is immaterial whether a compound of silver, gold, or manganese be used. Whatever preparation is selected, it should be injected deeply into the subcutaneous tissue round the lesion. In very severe cases it may be injected directly into a vein. The injection should be commenced on the fourth day, and repeated every second day. The immediate effect is a transitory rise of temperature, which develops within an hour, and continues for six to ten hours, after which the temperature falls to a point considerably below the previous level. In addition to the urinary changes already mentioned, the drugs intensify any albuminuria present, and may even determine the onset of albuminuria; but in all these cases the albumin ceases with the passing of the disease. The blood pressure is slightly raised. The results obtained by Robin are fairly satisfactory. Out of fifty-three cases, of which twenty-six were of a severe type, only six died; while in 63 per cent. the crisis occurred before the eighth day. The treatment was much less successful in cases of secondary bronchopneumonia.—*Bull. Acad. de méd.*, Paris, 1906, December 4.

THE ACTION OF CERTAIN DIURETICS, AND THE INDICATIONS FOR THEIR USE.

In this paper Loewi summarises the recent work of himself and other writers upon the action of the purin diuretics and those of the digitalis group. As types of the purin bodies, he selects caffeine, theobromine, and theophylline. Until quite recently, Schroeder's views have been generally accepted regarding the action of the purin group. This observer pointed out that these drugs had little effect upon the general blood pressure, and therefore concluded that their diuretic action must be dependent upon some local renal change. The two possibilities were either that they induced a local dilatation of the renal vessels leading to a better blood supply, or that they directly stimulated the renal epithelium. Schroeder adopted the latter view. He showed that severing the renal nerves induced dilatation of the renal vessels, but subsequent administration of caffeine caused diuresis. He did not know that the dilatation which results after severing the nerves connecting the kidney with the spinal vasomotor centres is not a maximal one, and his conclusion that the drugs must act upon the secreting cells is not necessarily correct. It has been shown since that the renal vessels contain nervous structures which can effect a further dilatation after the central vasomotor centres are thrown out of action. If caffeine or other purin body is allowed to act upon these local nervous elements after cutting the nerves, it induces a further dilatation of the renal vessels, which is shown by the blood in the renal veins becoming bright red and losing its venous character. It seems highly probable, therefore, that the purin bodies act through this local vascular effect, which supplies the kidneys with more blood. In support of this view, Loewi quotes experiments with cantharidin and chromic acid. Cantharidin causes glomerular irritation, while chromic acid destroys the tubular cells. Now, the purin bodies cannot induce diuresis in kidneys previously damaged by cantharidin ; whereas diuresis is still produced in the kidney damaged by chromic acid, which leaves the glomeruli intact. Loewi concludes that the action of the purin bodies is chiefly due to the local vaso-dilatation which they induce in the kidney. This may be aided by their action in dilating the coronary arteries, which improves the nourishment of the heart muscle, and so facilitates its work. The clinical rule not to use the purin diuretics in nephritis is not sound. They may be used in all forms of kidney disease except glomerular nephritis, and a certain diagnostic value attends their use. If they do not induce diuresis, the probability of a glomerular lesion is suggested. The second portion of the paper deals with the digitalis group of bodies. Here also the prevailing view has been attacked. The usual teaching is that these bodies act as diuretics by raising the blood pressure, but recent careful observations have shown that in medicinal doses it is questionable if digitalis does raise the blood pressure. In many diseased conditions it tends rather to lower the general blood pressure. The action is much more likely to depend upon the heart action. Under digitalis the heart acts better, the output of blood is increased, and the circulation is improved. Consequently the kidneys are better supplied with blood. In many cases of cardiac œdema the blood pressure still remains high, though the heart is not acting well. It is likely that this high pressure results from vaso-constriction of the peripheral vessels, either due to the mechanical pressure of the œdema, or, reflexly, as the result of deficient oxygenation of the vasomotor centres. The deficient kidney secretion here depends on the venous congestion and on the imperfect supply of blood, resulting from the constriction of the vessels and the weak cardiac action. Under digitalis the heart acts better, the congestion disappears, and with it the œdema is lessened. The improved circulation supplies the vasomotor centres with oxygenated blood, and consequently the stimulation of the vaso-constricting centres, as the result of the partial asphyxia, disappears. The kidney receives more blood, partly as the direct result of the improved cardiac action, and partly as the result of the disappearance of the vaso-constriction. The action, again, depends essentially upon more blood passing through the kidney in a given time. The fact that in such cases digitalis tends to reduce the blood pressure, suggests the question whether we are justified in using digitalis in cases where the blood pressure is very high. Such a condition is usually considered to contra-indicate the use of digitalis. In all cases of failing compensation, when the pressure remains high, one factor maintaining the pressure is the presence of œdema, and the resulting asphyxia, which can be relieved by digitalis. In cases which are not urgent, it may be well to lessen the œdema by the previous administration of diuretin. The simultaneous use of digitalis and diuretin is quite rational, and cannot do any harm. The effect of diuretin or other purin body in dilating the coronary arteries may improve the effect of digitalis by permitting the heart to be better nourished, although it is by no means certain that with medicinal doses digitalis constricts the coronary arteries in man.—*Wien. klin. Wchnschr.*, 1906, No. 52.

PATHOLOGY AND BACTERIOLOGY.

UNDER THE CHARGE OF

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Serum Diagnosis and Serum Therapy in Cerebro-Spinal Meningitis.

G. Jochmann (*Deutsche med. Wchnschr.*, Leipzig, 1906, May 17, S. 788) studied about thirty different specimens of the meningococcus obtained from different sources. Some were found to kill guinea-pigs on intraperitoneal injection of certain doses (3 mgrms.). By means of these virulent races he immunised a horse by first injecting dead microbes over a period of several months, and then living microbes, the injections being made subcutaneously and into the veins. After a time he found that the serum agglutinated the germ in a dilution of 1 : 1500, and by this means he could distinguish with certainty the true meningococcus from germs which resemble it. Further, this serum could, in certain doses, protect both mice and guinea-pigs from varying multiples of otherwise lethal doses. He then tried the serum upon forty people. In doses of 10 c.c. it had no effect, but in doses of 20 to 30 c.c. frequently repeated, it produced obvious improvement, particularly when injected into the vertebral canal. He believes that much good would be done by injecting subcutaneously 20 c.c. of the serum into all persons who come into contact with patients suffering from this disease, both as a prophylactic and to prevent them becoming meningococci carriers.

The Etiology and Diagnosis of Hydrophobia.

Since Negri in 1903 described certain bodies seen by him in the large nerve cells in sections of the central nervous system in hydrophobia, much work has been done in the same field. These bodies, now known as Negri bodies, have been described by many observers, and evidence in favour of their being not only specific for rabies but probably animal parasites and the cause of the disease, is increasing. Their diagnostic importance, at any rate, is now admitted by almost all. Negri describes them as round or oval bodies from 1 μ to 23 μ long, and containing vacuoles, in some of which are granules of varying size and number; generally there is a central larger structure surrounded by smaller ones. In his latest paper, June 1905, he states that the central body shows more characteristically as a nucleus in sections from rabid cattle. The work of the various writers, numbering thirty or more, is reviewed in the *Ann. de l'Inst. Pasteur*, Paris, 1905, and in the Referate of the

Centralbl. f. Bakteriol. u. Parasitenk., Jena, early in 1906. All the writers agree in the constant presence and diagnostic importance of the Negri bodies except Maas, who failed (*München. med. Wchnschr.*, 1905, Bd. lii. S. 119) to find them in sections from a case of human rabies. Schiffmann, who in his earlier papers reported that he always found them in street rabies, states lately (*Ztschr. f. Hyg. u. Infectionskrankh.*, Leipzig, 1906, Bd. lii. S. 199) that they disappear after a number of passages, that even after the second passage they undergo a marked diminution in number, and had practically disappeared after the forty-fifth passage, until in fixed virus in the rabbit no forms appear. He also found no forms in dogs inoculated with rabbit fixed virus. A most important paper on the whole subject, by Drs. Anna Williams and May Lowden, lately appeared in the *Journ. Infect. Dis.*, Chicago, 1906, vol. iii. p. 452. They sum up the results obtained by all the previous writers, and then describe their own studies, made under Dr. W. H. Park, in the Public Health Laboratory, New York. The former may be grouped thus—(1) In nearly 100 per cent. of definite cases of street rabies, Negri bodies are found in the large nerve cells of sections from all or from a part of the cerebal nervous system and the connected ganglia. (2) The bodies from 1 μ to 25 μ size have a central basophile mass in the form of a network, rings, or points surrounded by granules lying in the general homogeneous acidophile ground substance. (3) The bodies vary in number, from few to many. (4) No bodies have been found before the appearance of symptoms, though the central nervous system is infective before this time. (5) No bodies have been found in the peripheral nerves or in the salivary glands or other glands, although these organs have a certain degree of infectivity. (6) The bodies can only be demonstrated by sections, whose preparation takes at least three hours. (7) The filtered virus is infective, therefore some forms of the causative agent must be extremely small. (8) In no other disease have "Negri bodies" been found. (9) When the bodies are found in sections, the diagnosis of hydrophobia is established without the necessity for a biological test. (10) The significance of the bodies is still in doubt, for the following reasons—(*a*) They have not been found in all cases of hydrophobia, notably not in fixed virus, neither have they been found in all parts of the nervous system proved to be virulent; (*b*) forms small enough to pass through the courser Berkefeld filters have not been seen; (*c*) no definite series of forms indicating growth and multiplication have been demonstrated; (*d*) the staining qualities, contrary to those of known protozoa, are more acidophile than basophile. Drs. Williams and Lowden used the smear method, and obtained interesting results as to the rapid identification of the "bodies," their value in diagnosis, and their nature. Their paper is illustrated by a number of excellent drawings and photographs. They come to the following conclusions:—(1) The smear method of examining the Negri bodies is superior to any other method so far published, for the following reasons—(*a*) It is simpler, shorter, and less expensive; (*b*) the bodies appear much more distinct and characteristic, their minute structure can be better demonstrated, and they give characteristic staining reactions. (2) The smear method shows that the bodies are specific to hydrophobia. (3) Numerous bodies are found in fixed virus. (4) Bodies are found *before* the beginning of visible symptoms, *i.e.* on the the fourth day in fixed virus, seventh day in street virus. (5) Forms similar in structure and staining qualities to the others, but just within the limits of visible structure (× 1500 diameters), have been seen. (6) The bodies belong to the protozoa, for—(*a*) They have a definite morphology; (*b*) a define series of forms indicating growth, and multiplication can be demonstrated; (*c*) their structure and staining qualities resemble those protozoa known as Microsporidia. (7) "The proof that the 'Negri bodies' are living organisms is sufficient proof that they are the cause of hydrophobia; a single variety of living organisms found in such large numbers in every case of a disease, and only in that disease, appearing at the time the host tissue becomes infective in regions that are infective, and increasing in these infective areas with the course of the disease can be no other, according to our present views, than the cause of that disease." The authors' last conclusions are very interesting, but they cannot be unreservedly accepted. Not only is there no evidence of sporulation (shown by all true Microsporidia) in the "Negri bodies," but also no distinct proof that the bodies are really alive.

THE OPTICAL ADVANTAGES OF THE ULTRA-VIOLET RAYS IN MICROSCOPY.

SABINE (*Journ. Med. Research*, Boston, 1906, April, p. 455) explains the advantages of ultra-violet rays in microscopy. He shows that resolving power is greater, that achromatism is accomplished almost perfectly, that spherical aberration can be effectually corrected. Ernst adds a paper on ultra-violet photo-micrography, in which he shows its great value. He used the apparatus devised by Dr. Kohler in 1904, which is fully described in the *Ztschr. f. Mikroskop. Technik*, 1904, Bd. xxi. The apparatus is costly, and its mastery takes a good deal of study. Ernst says, "Even one accustomed to photo-micrographic work with ordinary light and lenses will need to exercise much patience and care to acquire any great facility in the use of the instrument." The advantages it secures in biological work are—(1) Great increase in the resolving power of the objectives, amounting in the case of the one with the shortest focus to almost double of that of any lens yet made. (2) It furnishes what amounts to a new method of staining. Objects photographed by these rays must be unstained, and thus any detail of structure shown upon the negatives are indications of differences in absorptive properties. The material should not be fixed direct, or hardened, or mounted in any of the ordinary ways, and hence photographs produce the actual conditions of life of cells and germs with a much greater and more perfect resolution of their structure than has ever been accomplished before. "Such possibilities as these cannot be neglected, for they open up a field for research that is new in every direction; so much so that practically every negative that is taken is of a new object." Most of Ernst and Wolbach's work was done on fresh tissues. The best mounting medium they found to be normal salt solution or Ringer's fluid, to which has been added from ½ to 1 per cent. of agar-agar. The slide is flooded with this mixture melted, and upon cooling there forms a semi-solid mass, apparently perfectly transparent to the ultra-violet rays, and serving admirably to hold individual cells in position. Blood, micro-organisms, and fixed tissue cells have been studied by them in this medium with equally satisfactory results. Prints do not do justice to the negatives. Lantern slides alone bring out all their beauty of detail. Some beautiful plates of moulds, yeasts, and bacteria show what the method is capable of doing. In the same month, April 1906, Grawitz and Gruneberg (*Wien. klin. Wchnschr.*, 1906, No. 17, S. 506) record their results after investigation of the cells of human blood by ultra-violet light. The red cells appear as circular, perfectly homogeneous bodies, slightly thicker in the middle. The nucleated reds of leukæmic blood are much darker, with a transparent nucleus of a radiate structure, and a perfectly homogeneous protoplasm. The lymphocytes range from small forms with round nucleus and scanty protoplasm to large uninucleated transitional forms. The nucleus of the small ones shows a more irregular structure and less transparency than those of the larger. The protoplasm of the smallest leucocytes has a flaky, cloudy, or almost granular appearance, which the authors think to be the earliest stage of granules. The nuclei of the polymorphonuclear corpuscles are different from those of stained preparations. They show neither the marked segmentation nor the connecting bridges between the different segments of the nucleus. They are also much more transparent than those of the small lymphocytes, thus indicating a different chemical composition. The granules differ in size in the different cells, and in transparency in the same cell. The nuclei of the eosinophiles had a dark appearance, and were beset with transparent granules. Leukæmic colourless cell types show everywhere a differentiated protoplasm. Blood plates never showed a picture which demonstrated any cell structure or distinct nucleus.

PHYSIOLOGY.

UNDER THE CHARGE OF

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The Relation of the Liver Cells to the Blood Vessels and Lymphatics.

This subject has attracted the attention of a very large number of histologists and physiologists, but even at present there are many important points connected with it about which there is great diversity of opinion. Among these may be mentioned, the nature of the intra-lobular blood and lymph channels, the existence of channels within the liver cells, and the position and functions of the cells described by Kupffer and now bearing his name. It is extremely important, both from the standpoint of the physiologist and pathologist, that our knowledge of the liver circulation should be accurate; and therefore one of the latest and most thorough researches dealing with this subject merits our most careful attention.

Herring and Simpson (*Proc. Roy. Soc. London*, 1906, vol. lxxviii. B,

p. 455), following up the work of Browicz and Schafer, have endeavoured to throw light upon the debatable subjects which have just been referred to.

They carried out a series of injections in different animals, both of the blood vessels and lymphatics of the liver, in order to determine the relations of the blood and lymph channels to the liver cells. They also studied uninjected specimens of the dog's liver, and discovered, in some of these cases, crystals similar to hæmoglobin within the nuclei of the liver cells. A more striking histological appearance than that represented in Fig. 1 of their paper, showing nuclei distended to an oval form by well-defined crystals, could scarcely be imagined. The exact nature of these crystals requires still, however, to be worked out.

The injections were carried out in such a way as to avoid, as far as possible, any possibility of the intra-vascular pressure within the liver rising so high as to cause rupture of the vessel walls. The conclusions which were come to by these investigators may be best summarised in their own words.

1. The liver cells are permeated by fine anastomosing channels, which can be filled with injection mass from the blood vessels. These channels undoubtedly receive plasma from the blood. In the dog, red blood corpuscles are occasionally seen within the liver cells, and crystals which closely resemble hæmoglobin are frequently found inside the cell nuclei. There must, therefore, be an intimate connection between the blood in the intra-lobular blood vessels and the liver cells.

2. The lymphatics of the liver (dog, cat) are confined to the visible connective tissue of Glisson's capsule and the adventitia of the hepatic veins. The lymphatic vessels accompany the hepatic artery and its branches, forming networks around these vessels as well as around the branches of the portal vein and bile ducts. There are no lymphatics within the lobules. The peri-vascular lymphatics described by MacGillavry do not exist. Both portal and hepatic lymphatics leave the organ at or near the portal fissure.

3. The endothelium which lines the intra-lobular blood spaces (Minot's "sinusoids") is incomplete, and allows the passage through it both of fluid and of fine solid particles into the liver cells. The endothelial cells are of two kinds—large and small. The large cells (Kupffer's cells) are phagocytic, and often project into the blood spaces.

4. The concentrated character of the liver lymph is explained by the incomplete nature of the endothelium lining the intra-lobular blood vessels, thus permitting the plasma to pass directly into the liver cells.

It is possible that the cells of the lobule form a syncytium, and the lymph is thus able to pass from cell to cell. It is probably passed at the periphery of the lobules into the interstices of the connective tissue which lies between the lobules; here it enters the lymphatics. All conditions which would tend to promote the activity of the liver cells should, by virtue of these arrangements, also tend to promote the flow of lymph.

This explanation of the relations of blood and lymph passages to the liver cells would go far towards solving many of the interesting questions concerned with the production and characters of the hepatic lymph (cf. the work of Starling, Asher, etc.).

THE EXISTENCE OF A FAT-SPLITTING FERMENT IN THE GASTRIC JUICE.

E. S. LONDON (*Ztschr. f. physiol. Chem.*, Strassburg, Bd. l. S. 125) has recently examined the gastric juice from a dog with a pyloric fistula, in order to determine whether there is a fat-splitting ferment or lipase present or not. Such a ferment has been described by Stade, Laqueur, Bickel, and others; but doubt has been expressed by many workers on this subject as to its presence in the freshly secreted juice.

Perhaps the more general belief has been that, in cases where a lipase has been detected, its presence has been due either to bacterial action or to the backward passage of pancreatic juice.

London has taken precautions to avoid any such admixture, and has found that the pure gastric secretion has but little effect upon fats. If special care, however, be not taken in making the fistula and arranging the cannula, there is always a well-marked fat-splitting action. With gastric juice obtained from a fistula where the ordinary cannula was employed, about 17 per cent. to 23 per cent. of the fats in the yolk of egg were decomposed. If, on the other hand, a cannula were employed, divided in such a way as to prevent any duodenal contents mixing with those of the stomach, the juice obtained showed only slight fat-splitting properties.

In the juice obtained from Pawlow's "small stomach," the fat-splitting action is also slight, namely, from 2 per cent. to 5 per cent.

PARTIAL REMOVAL OF GASTRIC AND INTESTINAL MUSCULATURE.

MÜLLER (*Arch. f. d. ges. Physiol.*, Bonn, Bd. cxvi. S. 171) has investigated the effects produced by disturbances in the musculature of the stomach and intestines, and has arrived at the following results. Partial removal of the musculature of the stomach leads not only to a very great weakening in its important motor functions, but also to very marked disturbances in secretion. These latter effects are of the nature of a hyper-secretion and especially of a hyper-acidity, free hydrochloric acid always being present. In similar operative interference with the musculature of the small intestine, there are practically no symptoms of disturbance. The *vis a tergo* is sufficient to drive along the food material past the paralysed portions of gut, and thus there is no retention and none of the signs of intestinal obstruction. Müller thinks that the subject of ileus paralyticus requires revision, the obstruction in this and similar intestinal disturbances not being necessarily due to the paresis of the musculature. The operative procedure was devised by Professor Kreidl of Vienna, and is described by him in the same journal (*Arch. f. d. ges. Physiol.*, Bonn, Bd. cxvi. S. 159).

DISEASES OF THE EYE.

UNDER THE CHARGE OF
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Retro-Bulbar Neuritis after Burns.

Among the rarer sequelæ of extensive burns of the skin may be mentioned the occurrence of retro-bulbar neuritis. This was known twenty years ago, for it was fully described by Mooren at that time, who thought it not improbable that neuritis was more common than one is apt to suppose. However this may be, the number of cases recorded is certainly very few, and when they have been described, the type of affection has not been so often the ordinary form of retro-bulbar neuritis as a neuro-retinitis with more or less abundant hæmorrhages in the retina. A case of this nature has recently been published by Lindenmeyer; it occurred in the person of a young healthy workman who received extensive burns of the first and second degree on the backs of the hands and forearms, and on the face. Healing ran a normal course; there was no rise of temperature after the first week, there were no cerebral symptoms, no albumen in the urine: the stools contained no blood. The burns were dressed with bismuth at first, and later with boracic acid; iodoform was not used. About three weeks after the accident, the patient complained of his eyes being stiff or pained when he moved them, and of the sight not being good; this symptom increased, until after another three weeks or so he was only just able to distinguish large objects. Lindenmeyer found him to have an absolute central scotoma, but without contraction of the fields; there was a slight degree of neuritis and a few hæmorrhages in the retina, near the discs. Treatment, unfortunately, did not prove very successful, and vision remained very poor indeed. Support is lent to the theory that perhaps some toxins are produced in burnt tissue whose action may set up this form of defect of vision by the fact, noted by Wiedenfeld in 1902, that if one introduces pieces of burnt skin into the peritoneal cavity of an animal, peritonitis and death invariably followed. The odd thing, if this theory is true, is that it is comparatively so rare to find examples of such severe forms of toxic inflammation when burns occur so frequently. But this is a difficulty which meets one at every turn in medicine.—*Klin. Monatsbl. f. Augenh.*, Stuttgart, 1906, No. 6.

High Tension in the Arteries as seen in the Fundus.

The earlier that the onset of increased intravascular tension can be diagnosed the better for the patient, who is often in the preliminary stages quite unaware that there is anything amiss with him, and sometimes, indeed, feels in particularly good health. De Schweinitz, therefore, does good service in drawing attention to the matter, even if his paper does not bring forward anything which one could exactly call new. Everyone knows the signs of established arterio-sclerosis and high tension, but it is important to note certain minor points which indicate the first beginnings. It is a truism now to point out that in the fundus we are able to examine with precision and care arteries too small to be intimately known to us in other parts of the body—vessels of the magnitude of those which are first attacked by sclerosis. De Schweinitz regards as suggestive indications uneven calibre of the arteries, and tortuosity of them, increased distinctness of the light streak, greater lightness in the colour of the whole breadth of the artery; any change in the course and calibre of the veins he regards as suspicious also. It is singular that the corkscrew appearance of arteries may be quite marked in certain arteries only, and non-existent, or at least very inconspicuous, in others; the small macular vessels are often early sufferers from this change at a time when no others in the fundus may show any sign. Where one of the veins happens to be crossed by an artery, the commencing hardening of the latter may show itself in a slight degree of flattening of the former as the more rigid vessel lies upon it; in the later stages this is, of course, much more obvious. He thinks, too, that there is a certain type of redness of the nerve head which is suggestive, but which it would be difficult to describe accurately in a few words. A very practical clinical point is that he thinks this condition of vessels is sometimes responsible for the asthenopia which is apt to come on in patients soon after forty, particularly in women. He advises that in examining the pulse in such patients special attention should be paid to the condition of the vessel in diastole, and not only in systole, and is sure that by means of such early diagnosis, followed necessarily by treatment and a careful regimen on the part of the patient, many a one might be kept alive longer and kept well longer.—*Ophth. Rec.*, Chicago, 1906, August.

THE ANTERIOR CHAMBER AND ITS CONTENTS.

RECENTLY a good deal of attention has been lavished on the anterior chamber, and several interesting papers have been published dealing with it. Leber has specially concerned himself with the relation of the aqueous to immunity, and is satisfied that by certain means its ability to inhibit the growth of organisms can be increased. He worked chiefly with rabbits, some normal, some actively, and others passively, immunised with reference to the cholera vibrio and to the *Bacillus typhosus*. As was only to be expected, he found that the aqueous humour has a lower inhibitory power than the blood serum, but that even in the aqueous the proportion of antibodies can be raised. This is still further raised if after immunisation a solution of NaCl is injected under the conjunctiva. Both agglutinins and bacteriolysins are thus increased, a result which is true not only of the aqueous, but of the lens and vitreous also. He considers it probable that the salt solution renders more easy the escape of antibodies from the blood serum.

That the fluid in the anterior chamber is absorbed and reformed is certain, but at what rate? Is there any current in its serene depths? Pfluger has been for some time engaged upon a careful investigation into the rate of secretion, and puts it down (in the dog) at about 6 to 8 cubic millimetres per minute.

A number of years ago Ehrlich noticed a curious phenomenon in regard to the anterior chamber. If a sufficient quantity of fluorescin is introduced into the circulation of an animal, a green coloration appears in the anterior chamber, but in a curious form, namely, as a vertical line in the middle line of the anterior chamber, just posterior to the cornea. This line changes continually—becomes narrower, broader, more distinct, less distinct, and so on. This was at first thought to be due to two lateral, or even two circular, currents, but a singular point is that in whatever position the eye is held the line is always vertical, which seems to negative this explanation. It must surely be due to gravity, but that there is no collection of the coloured matter at the foot of the anterior chamber, such as we see in hypopyon keratitis. Türk gives what appears likely to be the true explanation. It is a well-known fact that the cornea has a lower temperature than the rest of the eye; as a matter of fact its temperature is about 4° below that of the aqueous, and 10° below that of the iris. It is this difference in the temperature which causes currents in the fluid by altering its specific gravity. To test the accuracy of his theory, Türk made a glass chamber with a watch-glass and a flat plate, in imitation of the anterior chamber, and kept the anterior wall cool, while the posterior was warmed. Then he cautiously introduced a drop, or two drops, of a weak solution of fluorescin, with the result that presently Ehrlich's line was developed. If he introduced the coloured fluid *before* warming the posterior plate, a simple diffusion of the green tint was the result, but as soon as the warming had gone on for a very short time the particles began to arrange themselves as in the real aqueous humour, and the vertical green line appeared; the greenish clouds seemed to wake up, and at the periphery, because there the layer of fluid is thinnest, and therefore most readily warmed, a definite current began to flow upwards, the currents from the two sides meeting at the highest part, and the coloured stream descending at the centre of the posterior face of the "cornea," that being the coldest part. He was able further to demonstrate the matter in animals by injection of the rabbit with fluorescin, leaving one eye in its natural state, and keeping the other cornea constantly bathed with fluid at body temperature. In the normal eye the usual normal appearances showed themselves, while in the eye, the temperature of whose cornea was kept high, there was a more general diffuse pale green tint and no line. The phenomenon, which has puzzled a number of observers, seems thus satisfactorily accounted for.—*Arch. f. Ophth.*, Leipzig, Bd. lxiv. Abth. 3.

REPORTS OF THE MEDICAL SOCIETIES.

EDINBURGH MEDICO-CHIRURGICAL SOCIETY.—*February* 6, 1907.—Dr. J. O. AFFLECK, President, in the chair.—Dr. CHALMERS WATSON read a paper on "The Treatment of some Diseases commonly regarded as of Gouty Origin." The conditions dealt with included migraine, "rheumatic" pains, recurrent nasal catarrh, and some vague ill-defined symptoms often met with after middle life. Many such cases prove obstinate to ordinary treatment. The line of treatment he had adopted consisted in restricting the allowance of proteid food, in using hydrotherapeutic measures such as Turkish baths, and in the administration of small doses of thyroid gland substance. In his opinion, the excessive ingestion of animal food threw an undue strain on the thyroid gland, tended to exhaust it, and thus affected the metabolism. Dr. Watson then went on to compare gout and tuberculosis in this relation. The subjects of inherited (or acquired) gout have acquired an abnormally active thyroid gland, which works, so to speak, at high pressure. Subjects predisposed to tuberculosis have an inactive thyroid glandular system. Thus in the treatment of gout the restriction of animal food is of special value. In tuberculosis, on the other hand, a disease of less developed and less robust subjects, the use of a great excess of animal proteid food is to be recommended. Dr. Watson next referred to some experiments he had conducted on animals in whom an excessive meat diet produced changes in the thyroid and other organs. The thyroid was over-active, and gave evidence of having an undue strain thrown upon it. Appearances which were very similar were also found in the offspring of meat-fed animals. He concluded by advocating that the children of gouty subjects should get little or no red meat till they are six years old, and that, on the other hand, the children of tuberculous subjects should, from earliest periods, receive a liberal supply of red meat in an appropriate form. — Drs. JOHN THOMSON and STUART M'DONALD read a paper entitled, "Note on two Fatal Cases of Acute Meningococcal Cerebro-spinal Meningitis in young Children, with pathological report on one of them." Cases of non-tuberculous meningitis they had hitherto been accustomed to meet with may be divided into—(1) those due to pyæmic infection; (2) acute pneumococcal meningitis; (3) chronic or sub-acute posterior basic meningitis. The last named formed the majority, occurred mostly in young infants, and were due to a spinal diplococcus practically identical with the meningococcus of Weichselbaum. Within the last few weeks they had met with a fourth group—acute cerebro-spinal meningitis—in which the cerebro-spinal fluid contained typical meningococci in large numbers. These cases were far more acute than the ordinary basic form, the duration being measured by days rather than weeks. The two cases met with were then described, and the post-mortem report on one of them stated that there was an acute leptomeningitis of the brain and cord. The vertex of the brain was affected as well as the base, and meningococci were found in the exudate; the other organs showed evidence of an acute toxæmia; there was no pneumonia. The authors suggested that attenuated meningococci might exist in the nasal and other secretions of many children, and that, under certain conditions, these organisms might become virulent, and give rise to the acute epidemic form of the disease. Dr. WILLIAM ELDER read "Notes on Five Cases of Acute Cerebro-spinal Meningitis." He gave an account of the clinical phenomena and the post-mortem findings in the fatal cases. He drew special attention to the extremely acute course which some of the cases ran. The drug which had proved of most value in treatment was morphia; chloral, bromide, and paraldehyde, which were efficient in tuberculosis and other forms of meningitis, had failed in these cases. Both papers were illustrated by microscopic demonstration of specimens and cultures. An interesting discussion followed.

EDINBURGH OBSTETRICAL SOCIETY.—*February* 13, 1907.—Dr. J. W. BALLANTYNE, President, in the chair.—Dr. HAULTAIN read "A Clinical and Anatomical Study of Thirty Cervical Fibroids removed by Abdominal Hysterectomy." This will appear in an early issue of the Journal.—Dr. ROBERTSON DOBIE, Crieff, read a paper on "A Method of Delivery by Forceps in some difficult Occipito-posterior Cases." He referred to the various methods suggested for dealing with occipito-posterior positions, and then described in detail a procedure which he had found useful. It consisted in applying the forceps with the pelvic curve backwards, and in this way he found he promoted flexion and prevented the extension of the head, which was the cause of difficulty and delay. The method was only applicable when the head had descended to the pelvic floor.—Dr. BARBOUR read a paper on "Hysterectomy in Pregnancy for Uterine Fibroid. Two Cases." The first case was a multipara, in whom, after four months' amenorrhœa, a tumour the size of a fœtal head was discovered growing from the posterior lip of the cervix, and displacing the uterus upwards. Panhysterectomy was performed, and the patient recovered. The second case was a patient who had an abortion at the third month, a year after marriage. Eight months later she became pregnant, and, after four and a half months' amenorrhœa, a uterine fibroid on the right side was discovered. In this case supravaginal hysterectomy was performed, and the patient recovered. In conclusion, Dr. Balfour pointed out that hysterectomy during pregnancy was easier than under other circumstances, owing to the greater laxness of the tissues.

GLASGOW MEDICO-CHIRURGICAL SOCIETY.—*February* 1, 1907.—Dr. J. LINDSAY STEVEN, President, in the chair.—Dr. DUNCAN showed—(*a*) A case of cerebro-spinal meningitis of the epidemic type due to the meningococcus, specimens of which were shown under the microscope. —this case, as also another which had recovered, had been treated with salol; (*b*) a case of spasm of the sterno-cleido mastoid and trapezius muscles brought on by overuse at work; (*c*) cases of empyema and pleurisy treated by injections of protargol; (*d*) a case of exophthalmic goitre.—Dr. NAPIER showed cases of—(*a*) Facial diplegia; (*b*) facial paralysis from injury during operation; (*c*) aneurysm of the transverse part of the arch of the aorta presenting few signs; (*d*) insular sclerosis following injury to the head; (*e*) primary lateral sclerosis with facial paralysis; (*f*) infantile paralysis which had at first affected all four limbs, and now caused complete paralysis from knees downward; (*g*) pernicious anæmia; (*h*) lupus.—Mr. PARRY gave a lantern demonstration on the rôle of the lymphatics in malignant disease. He dealt at length with mammary and gastric cancers, and showed that, with a knowledge of the lymphatic channels and glands which could possibly be affected, careful examination of glands before or during the operation gave one a guide as to the extent or nature of the operation which was advisable in a given case, and was also of first importance with regard to prognosis. He dealt also with malignant disease affecting the rectum, the tongue, and other parts.—Mr. GRANT ANDREW showed—(*a*) Two cases of enterectomy; (*b*) two stomach cases—(1) ruptured gastric ulcer, (2) pyloric stenosis; (*c*) a case of rupture of the tendo Achillis; (*d*) a hip-joint case, with skiagrams.—Dr. BROWN KELLY showed—(*a*) Two cases of multiple telangiectases of the skin and mucous membranes of the nose and mouth, showing marked difference in temperature between the healthy and diseased parts; (*b*) cases of insufficiency of the palate posteriorly without any cleft; (*c*) cases showing pulsation of the internal carotid in the pharynx due to tortuosity, and presenting possible dangers in operating in that region; (*d*) a man with the epiglottis reaching into the naso-pharynx due to shortening of the neck from cervical caries; (*e*) a woman with malignant disease in right pyriform sinus, etc.; (*f*) patients who had been operated on for deviation of the nasal septum by submucous resection.—Dr. COUPER showed—(*a*) A case of universal pemphigus foliaceus, which had recovered. The blood showed an eosinophilia amounting to 67 per cent. of the leucocytes. The bullæ gave a pure culture of *Staphlyococcus albus*, and contained eosinophiles in abundance. (*b*) A case of keloid of the ear.—Dr. A. A. GRAY showed preparations of the internal ear with stereoscopic photographs.—Dr. HUGH WALKER showed microscopic ophthalmic preparations.—Dr. M'LELLAN showed—(*a*) A patient operated on for a universally adherent ovarian cyst, complicated with double pyosalpinx; (*b*) a rapidly growing fibroid in a woman past the menopause.

GLASGOW MEDICO-CHIRURGICAL SOCIETY.—*February* 15, 1907.—Dr. J. LINDSAY STEVEN, President, in the chair.—Dr. W. S. LAZARUS-BARLOW, London, read a paper on "Endothelioma," illustrated with microscopic specimens. He accepted the usual belief that endothelium was mesoblastic in origin, and consequently he would expect to find endotheliomata more closely allied to the sarcomata than to the carcinomata. Proliferation of endothelium in a vessel wall might take place inwards, outwards, or in both directions, and to the resulting conditions he gave the names of enthelioma, perithelioma, and perienthelioma respectively, while a further subdivision into hæmal- or lymph-endotheliomata might be made according as their origin was from blood or lymph vessel. Some cases of spheroidal-celled carcinoma with vacuoles he considered were really endotheliomata, in which the vessel had been altered in shape by the pressure of the surrounding connective tissue, and the so-called vacuoles were really the result of an attempt at lumen formation. Cases of angeio-sarcoma could be distinguished if one recollected that in the former there was proliferation of endothelium only as part of general vascular proliferation, while in the latter there was proliferation of endothelium *qua* endothelium. Cases of squamous-celled carcinoma of the cervix and spheroidal-celled carcinoma of the breast were often histologically identical, and could not be differentiated unless the observer were previously informed of site of origin. In squamous-celled carcinoma the only difficulty was if proliferation began in, and confined itself to, the Malpighian layer or to the prickle-cell layer, for if the keratinous layer were developed the presence of cell nests was diagnostic. He gave statistics of all cases of malignant tumour examined by him during past seven years in two series, the first, 1900 to 1904, and the second, 1905 and 1906. He found that the relative proportion of endotheliomata to total malignant cases in any site where the numbers were large enough, corresponded in the two series, each being from personal diagnosis. From this it was inferred that he had a definite idea in his own mind as to what he meant by the term endothelioma. Clinically, he found that in the majority of cases they gave rise to very widespread metastases. On the other hand, he had seen cases histologically indistinguishable from these, which were quite benign. He was quite prepared to be told any day of the discovery that the sarcomata were parasitic or inflammatory in nature, but he held as strongly the view that the carcinomata had a different origin. He thought many of the mouse cancers were really endotheliomata, and as these were mesoblastic and so sarcomatous in nature, he questioned if the subject of the transmissibility of mouse cancer were really getting at the root of the matter with regard to carcinomata.

GLASGOW PATHOLOGICAL AND CLINICAL SOCIETY.—*February* 11, 1907.—Dr. J. LINDSAY STEVEN, the President, in the chair.—Card specimens were shown by Professor MUIR—(*a*) Spinal cords from cases of cerebro-spinal meningitis; (*b*) specimens from a case of generalised melanotic sarcoma (primary tumour in the eye).—Dr. JOHN ANDERSON showed—(*a*) A kidney the seat of tumour of the adrenal type; (*b*) a brain with basal meningitis from a case of pneumonia.—Dr. JOHN H. TEACHER showed specimens from two cases of abscesses in the liver secondary to septic cholangitis.

FORFARSHIRE MEDICAL ASSOCIATION.—*February* 7, 1907.—Dr. MACKIE WHYTE in the chair.—Dr. DON showed a case of favus which had been treated by X-rays and an ointment of oleate of copper. The final result was satisfactory, the hair having grown in over the entire scalp, and the disease remained cured at the end of three months.—Dr. H. C. BUIST read "Some Notes on Obstetric Albuminuria and Eclampsia," dealing with sixty-seven cases of albuminuria and thirty-three of eclampsia which had occurred in Dundee Royal Infirmary. These gave a morbidity rate of 8·8 per cent.; but he estimated the natural rate for the Dundee district at 4·5 per cent., which agreed also with his own observations in private practice. Albuminuria was more than twice as frequent in first pregnancies, and eclampsia about ten times more frequent in first than subsequent pregnancies. The cases showed an interesting seasonal distribution, with very distinct maximum in winter and minimum in summer. The ante-mortem death-rate of the children was high in eclampsia, and moderate in simple albuminuria. Seven women died of eclampsia. Of thirty-one cases, twelve had fits ante-partum only, four post-partum only, and fifteen cases both. Of seventeen cases of albuminuria admitted for treatment during pregnancy, none developed eclampsia, though several had premonitory symptoms. The treatment of the albuminuria consisted in a milk diet, followed later by chloride free diet. In the management of the eclampsia, dilatation of the cervix was practised fifteen times, of which six were by Bossi's method. Forceps were applied seventeen times, three being perforated. The medical treatment was mainly hot packs and baths, morphia in full doses, and saline suffusions. Veratrum had not given sufficient results to warrant its continuance. In the albuminuria cases twins occurred twice, cardiac disease five times, and pyonephrosis twice.—Dr. DON read a paper on "Excision of Cancer of Breast."—Dr. FOGGIE read notes of a case of subcutaneous emphysema complicating an attack of whooping-cough in a delicate child of 6 months. It occurred in the third week, and lasted three weeks in all. The neck, face, and scalp were involved. The condition was recognised as a definite but infrequent complication of whooping-cough and of some other chest affections.

ANALYTICAL REPORTS.

MESSRS. PARKE, DAVIS, & CO.'S PREPARATIONS.

Esentia de Calisaya.—Although the tonic and restorative properties of cinchona are doubtless chiefly due to the quinine it contains, it is preferable under certain circumstances to administer the bark itself rather than the alkaloid alone. *Cinchona Calisaya* is richer in quinine than in other alkaloids, and for this reason is peculiarly suitable for prescription. Each ounce of the essence of Calisaya bark prepared by Messrs. Parke, Davis, & Co. contains 24 grs. of Peruvian bark. It is compounded with various aromatics which give it an agreeable flavour; were it not, indeed, for its decidedly bitter taste, it might readily pass for a liqueur of the Benedictine or Chartreuse order. The dose is from 1 to 4 drms.

Elixir Heroin and Terpin Hydrate is a preparation in which are combined the sedative properties of heroin and the stimulating action of terpin. It may be employed in all catarrhal affections of the respiratory passages, and we have found it very efficacious in the irritable cough which is so common and troublesome an accompaniment of influenza.

Adrenalin and Eucaine Tablets.—Each tablet contains $\frac{1}{2000}$ gr. of adrenalin and $\frac{1}{6}$ gr. of eucaine, with enough sodium chloride to impart salinity to the solution. One tablet dissolved in 17 minims of distilled water forms an ischæmic and analgesic agent suitable for use in dental and allied procedures, containing as it does 1 per cent. of eucaine and 1 : 30,000 of adrenalin. The more dilute solution, which is useful for infiltration anæsthesia, is made by dissolving six tablets in 1 oz. of water. The tablets are supplied in tubes containing twenty-five.

Vest-pocket Inhaler.—This little appliance consists of a vulcanite cylinder about 2 in. long, its ends being closed by a nozzle and cap. It can easily be charged with a few drops of any volatile substance when the cap is unscrewed. When both nozzle and cap are screwed up it may safely be carried in the pocket without risk of leakage. For use, the nozzle and cap are slightly unscrewed, so that air may be drawn through, while by reason of its small size this can be done without attracting attention. A bottle of menthol-pinol inhalant is supplied with the apparatus, which ought to be found useful.

EDINBURGH MEDICAL JOURNAL.

EDITORIAL.

Sir Henry Littlejohn and the Presentation of his Portrait.

We were musing, as we left the ancient hall of the Royal College of Surgeons of Edinburgh, on the afternoon of the 8th March, on the versatility of the man in whose honour so representative a gathering of the leading members of the faculties of law and medicine had assembled, when there came into our mind an apologue in the second of the Pythian Odes of Pindar, himself one of the most fitful of poets. The *dramatis personæ* are a certain Pithon, Reynard, and Lukos. In the midst of much badinage the question is asked, "But what good comes of this to Reynard?" "Why," he replies, "I swim like a cork, and ever come bobbing up, however much the rest of the fisherman's net be submerged." And the characteristic of the hero of the hour, Sir Henry Littlejohn, is, in brief, that of Reynard. He may be defined as the embodiment of mental and physical alertness, of a readiness which, however suddenly called upon, never fails; thought and language mutually responding with lightning-like rapidity. Yet at some period of the past he must have manifested an apparent flaw, else one can hardly explain why three such cautious, matter-of-fact, and experienced practitioners as the elder Begbie, Professor Henderson, and Andrew Wood (for these, we are credibly informed, were the culprits) could otherwise have dealt out so parsimoniously his expectation of life. As we now see, all three miscalculated the latent reserve of force existing in the man. How shallow are our best efforts to forecast the future! As it is pace and not distance which exhausts the steed, so it is worry, not work, which wears out the individual. One would have thought that, in the pursuit of his many avocations, Sir Henry must have had enough, and more than enough, of both; yet his innate buoyancy always brings him to the surface, as fresh and irrepressible as ever. Seldom, perhaps, has a painter had a more difficult task to accomplish than to limn successfully such a personality. But Sir George Reid has risen nobly to the occasion, and has made his subject to live on his canvas in all the plenitude of vitality. It may be said of Sir Henry as truly as of Moses, that his eye has not become dim, nor is his natural force abated. To one so constituted, rest and retirement are unthinkable; and we are not surprised that he closed his reply by observing that he hoped to live on to the end of his natural life, which, according to Dr. George Keith, is not less than a century.

Faith-Healing—Ancient and Modern.

SUPERSTITIONS may be treated in several ways. The average reasoning man dismisses them as nonsense; the irrational credit them implicitly, or yield to the slovenly habit which is ready to admit that "there may be something in it." Thoughtless people argue against them: we say "thoughtless" advisedly, for it is the essence of a superstition to be an irrational belief, as incapable of overturn by direct argument as the systematised delusion of a paranoiac. Yet superstitions are not impregnable; they may for long deny all frontal attacks, but in the end they will fall before the sappers' trenches on their flanks and rear.

Faith-healing in its manifold guises is a superstition which has practical interest for medicine. Whether the sufferer seeks relief at the shrine of Our Lady of Lourdes, or in the swelling throng round the temples of Mrs. Eddy, the mental attitude is the same, and it is common enough to compel attention. One aspect of faith-healing—the visitation of shrines and temples in the hope of cure (Incubation is the technical name of the practice)—has just been investigated by Miss Mary Hamilton,[1] who is thoroughly versed in the methods by which modern anthropology is daily discovering how our ancestors thought and acted. Miss Hamilton takes as her starting-point the faith cures which were wrought at the temples of Asklepeios. Authentic information concerning these has been gained from votive and other inscriptions dating back to the third and fourth centuries B.C. Pilgrims came from all quarters to the Temple at Epidaurus, paid dues to the deity, slept within the sacred precincts, dreamt dreams and saw visions, and awakened cured. Records of their cases are still decipherable, and the curious will note their similarity to those of Lourdes in the present day. The madman, the dumb, the blind, the palsied, the lame: these form the majority of the happy ones, whom Asklepeios relieved through dreams. The cult of Asklepeios endured to Roman times, and extended widely through the whole basin of the Eastern Mediterranean. Its practice was evidently in full vigour in the second century of our era, as we may judge from Aristides' account of his search for health in 162 A.D. The words of that Roman valetudinarian might have been uttered yesterday: his indigestion accompanied by fever, sleeplessness, and excessive perspiration; the physicians who marvelled at, but could not cure, his varied maladies—*τὴν ποιϰιλίαν τῆς νόσου*; his certainty that he was at the point of death; his ultimate cure by following the directions of Æsculapius,—he must have been an enricher of the Holloways and Siegels of his day. Among subsidiary cults in classic times substantially agreeing with that of Asklepeios, those named after Dionysus, Isis, and Serapis are the most familiar. During the Middle Ages the practice of incubation persisted. The Early Church, on supplanting Paganism, dealt with this custom as with many others: it made it its own, replaced the temple by a church, the heathen pantheon by the saints. Thus, among many others, we have the cults of St. Cosmos and St. Damian, identified with the Dioscuri who healed at Byzantium, of St. Michael, St. Therapon, and the rest. But the name, the mythological gloss alone, is altered; the practice, as ever, remains substantially unchanged. The same diseases, the same vigils, fastings, and visions, the same sacred wells, the same cures, are the story of faith-healing through the Middle Ages. The history of the cult from the sixteenth century onward is a repetition. The Panagia, or Virgin, now holds place of power, but the peasant, as Miss Hamilton testifies, still performs the same old rites before the same local saints, who sometimes in their very names and attributes reveal their pagan parentage—witness St. Dionysius of Naxos who first gladdened men's hearts with wine, the evident descendant of Dionysus, the wine-god. That modern practice is fundamentally identical with that of the ancients, will not be denied by any one who has visited Lourdes, or read of the cures at Notre Dame de la Salette, and then follows Miss Hamilton in tracing the custom through 2500 years.

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[1] "Incubation, or the Cure of Disease in Pagan Temples and Christian Churches," London, 1906.

What does it all amount to? Faith-healing as we now know it, under whatever name it masquerades, is at bottom the same. We have traced one of its main currents as an unbroken stream of practice back to early classic times. Miss Hamilton guides us no further than this stage of culture, which is, of course, far too late to show us the origins of the belief. There would be little difficulty in exploring further, and as we reached a ruder civilisation showing how the source of the practice inevitably springs from primitive man's philosophy: ample materials for that proof exist. Faith-healing, therefore, is naught but a survival: that is its strength as a popular creed; its weakness when it tries to bolster itself up by arguments from fact. That is why, invincible as it seems to reason, it will one day crumble before a more universal knowledge of the evolution of man's faculties; meanwhile those who trust in it do so, not (as they think) by their reason, but as a part of their heritage from their remotest ancestors.

American Surgery.

A PAMPHLET by Dr. Whiteford[1] records the impressions of one of the many who crossed the Atlantic last autumn, and came back with decided views on the subject of American surgery. With his main contention that American surgery is of the highest class, no one will disagree. We would go further, and express the opinion that there is no better surgical work to be seen anywhere than in the best clinics of North America.

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[1] "Glimpses of American Surgery in 1906," by Dr. C. Hamilton Whiteford. Harrison & Sons, London, 1906.

The American is naturally endowed with many of the qualities which make for success in operative work, and the American surgeon is developed on very special lines. He does not, as a rule, devote the two or more years to the study of anatomy on the dead subject, which is regarded as the orthodox training for the surgeon in this country. He believes, rightly or wrongly, that it is better to study normal anatomy and the early stages of morbid anatomy on the living subject in the operating-room, than on the cadaver in the dissecting-room or mortuary; and if the opportunities for becoming familiar with the details of operating are insufficient while still an assistant, he may seek to perfect himself in manipulation by practising on animals. Like other surgical aspirants, his first aim is to get personal charge of beds, not necessarily at a public or a teaching hospital, but it may be in a nursing home undertaken on his own responsibility, or in a cottage hospital financed by philanthropists at his instigation. He then begins to operate in earnest, and from the outset his ambition is to operate better than any one else. In his vacations he visits other clinics in his own continent, or he crosses the Atlantic and makes for one or other of the well-known clinics in Germany, less commonly those in France, Switzerland, Italy, Sweden, or in this country. In his heart he would prefer Great Britain, if from no other reason than to benefit from the facilities afforded by the common language; but he has found that surgical practice in this country is too conservative to be used as a model for so progressive an art.

He returns home with increased reputation, to which an account in the newspapers of what he has done abroad may have to a certain extent contributed, and his *clientèle* increases at a rate unheard of on this side. Having shown while he is still young that the right of the matter is in him, he is promoted to a teaching hospital, or he arranges with a sisterhood to run a hospital or nursing home, which may contain from one to two hundred beds, for himself alone. He then organises his work on the basis of the subdivision of labour. His means may now enable him to employ a large staff of assistants, anæsthetists, pathologists, electrical specialists, house-surgeons, and stenographers, all exclusively devoted to his service. He rarely sees a patient outside his nursing home or office, and not even then till the case has been sifted by his staff down to the minutest detail. The result is that he has plenty of time to operate, and operate he does for five or six hours on five or six days of the week. His staff is not only numerous and highly trained, but is a permanent one, on the German plan, and the work is thoroughly organised, like the *ensemble* of a Wagnerian orchestra, with the result that there is attained an efficiency which requires to be seen to be appreciated.

By the circumstances of his work, there is little time spent in systematic teaching, visiting patients, conducting examinations, attending meetings, and the thousand and one other distractions of any one attached to a teaching hospital.

The typical American surgeon does not allow himself to be distracted from the main purpose of his life by claims outside his strictly professional duties, by recreations, or by social obligations. His is a strenuous life, no doubt, but one of great opportunities and fruitful in achievement; and it is only when he gets run down, as he is apt to be after two or three years' continuous work, that he gives up and comes to Europe, or goes into the wilds of his own continent, out of reach of telegrams, for three or four months. It is not a matter of surprise, therefore, that the American surgeon of to-day is a man of great capacities and great practical achievements, unlikely to be surpassed in manipulative dexterity by the surgeons of any other country.

"Case-Teaching."[1]

A BOOK on clinical medicine, admittedly designed not for the student, but for his teacher, is something new. It is not inappropriate that this novelty should come from Boston, for that city has supplied many of its teachers to a school which aims at training its pupils how to instruct in, rather than how to practise, the arts of medicine and its handmaid nursing—we mean the Johns Hopkins Hospital. Dr. Cabot, who is the originator of "Case-teaching" in medicine, explains in his preface how it is done. The teacher provides himself with a store of "cases"—actual brief records as they have occurred in his practice. One of these he reads to his class, and, after allowing them time to digest it, calls for written diagnoses. Sorting these out, he rejects the wild and impossible, and, taking the least plausible of the others first, he calls upon the authors for reasons and arguments for their diagnoses. Ultimately things are narrowed down to one or two probabilities, and finally the result, as ascertained by operation or autopsy, is given. In the hands of a good teacher it is easy to see that such a method will to a great extent reproduce what occurs in actual practice. In the first examination of a patient, we all know, for instance, that important methods of examination or other data are apt to be omitted either from necessity or inadvertence. Hence, while the "cases" (which reproduce these failings) are under discussion, the students are compelled to think out for themselves whether any facts are lacking on which to base a conclusion. Side issues of all kinds arise which will call for consideration, and prognoses and lines of treatment have to be thought out. Dr. Cabot gives a variety of practical hints on how most profitably to carry out such teaching.

"Case-teaching" of this kind is a compromise between work in the ward, work in the clinical laboratory, and the systematic lecture. It is, however, something more than any of these, and will be useful only if employed in its proper place. The first thing a student has to do is to learn to estimate symptoms, to recognise physical signs, and to employ clinical methods. This done, he has to learn to interpret them, and to realise their bearing when grouped together. In this second direction, case-teaching will be serviceable. It has the advantage over the ward clinic that material is always available; besides, no expensive apparatus is needed, and comparatively large classes can be taught. It has the advantage over the systematic lecture that as the students do the work their attention is retained. Dr. Cabot's book consists of seventy-eight case records selected from among those he has used in this way during a number of years, with suggestions, questions, and comments appended. The method is one which has obviously much to commend it, and on this elaborated and systematised scale, at least, is a novelty on this side of the water.

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[1] "Case-Teaching in Medicine," by Richard C. Cabot, M.D. Boston: D. C. Heath & Co.

A New Sign of Death.

It is a curious fact that France has practically monopolised the investigation of one subject in Forensic Medicine, and crowded all rivals out of the field. We refer to the attempts to discover a certain and infallible sign of death. Over one hundred years ago a handsome sum of money was offered by the Academy of Medicine to any one who should discover a means of absolutely determining the existence of death before the appearance of putrefaction had rendered the fact indubitable. The result has been that the number of candidates who have entered the lists has been legion, and that the methods suggested for thus enabling their names to be inscribed on the roll of fame, as well as adding to their material benefit, have ranged from tests of grotesque simplicity to those of the most fantastic and impracticable nature. So far, no one has secured the coveted prize; and since the discovery of the stethoscope, with the means thereby afforded of recognising the slightest evidence of the heart's action and of respiration, most people have been content to allow the inquiry to drop. Not so, however, the French, who cling tenaciously to the belief of the reality of the danger of premature burial.

It is a remarkable circumstance that, with the exception now and then of a blood-curdling account of an alleged premature burial in the yellow press of America, and its transcription into some of the same class of papers in this country, we never hear of such cases. We quite admit that cases of apparent death may occur in which the question of its reality may remain doubtful until the case has been submitted to examination by a medical man; or that, in times of war, panic, and pestilence, even doctors may, through carelessness, mistake a condition of profound syncope for death; but such circumstances do not occur in everyday life; and we may safely aver that if cases of apparent death were as frequent as certain people would have us believe, we should have the fact duly recorded in medical journals.

In France, however, for some reason or other, the difficulty of recognising the reality of death, and therefore the danger of premature burial, is apparently greater than in this country, since we find that Dr. Icard of Marseilles has not only induced several municipalities, including Besançon and Boulogne-sur-mer, to order their medical officers to employ his fluorescine test in cases of death, but he has now brought forward a new test. He calls it "par excellence un signe de mort vulgaire," because its application requires no medical knowledge, and it can be employed by any one.

It is based on the supposed fact that before there are any visible signs of putrefaction, sulphuretted hydrogen is given off from the lungs, and escapes from the nostrils of the deceased. Accordingly, pieces of paper which have been treated with acetate of lead will become blackened if placed in the nostrils of a corpse.

Icard suggests, therefore, that pieces of paper, on which "Je suis mort" has been invisibly written with the lead solution, should be given to persons when they come to register a death, at which no medical man has been present. These pieces of paper are to be placed in the nostrils of the deceased, and next day the relations will bring them back to the registrar with the fateful words "Je suis mort" rendered visible, thus bearing incontrovertible testimony to the existence of death. The idea of a deceased person thus publicly announcing his own death possesses a certain alluring fascination. Unfortunately, however, Dr. Icard's zeal seems to have outrun his judgment, since, from many observations which we have had the opportunity of making, the test has shown itself to be most unreliable—in fact we have kept bodies for a week or more, and long after other signs of putrefaction have appeared, without the pieces of lead paper which were placed in the nostrils indicating more than the merest trace of discoloration.

The Removal of the Healthy Appendix.

THE removal of the healthy appendix is becoming a well-recognised practice with many surgeons during the course of other abdominal operations. It has been adversely commented upon, more especially by recent visitors to the United States, where it is more extensively practised than in other countries. It has been maintained that the removal of a healthy organ in order to prevent possible disease in the part removed, however small the risk to life or health involved in such removal, is fundamentally unsound. We believe that in this, as in other questions relating to the surgery of the appendix, the American lead is a good one. Is it not the case that we should all prefer to be without an appendix?

Why not, therefore, take advantage of a laparotomy or a herniotomy in which the appendix is readily accessible, and can be removed without risk and without adding to the duration of the convalescence. Nothing can be more annoying to a person than to have a laparotomy, let us say, for an ovarian cyst or a gall stone, and in the following year to be laid up with an appendicitis, which may not only call for another operation, but may endanger life. We have seen this sequence of events sufficiently often to make us converts to the American practice.

Vaccination for smallpox may not be an exactly parallel case, but we are bound to say, even at the risk of stimulating the anti-vaccinationists, that the chances of any person becoming the subject of appendicitis are very much greater than of an unvaccinated person living in a civilised community acquiring smallpox.

The removal of the appendix is not recommended as a universal practice after the fashion which prescribes circumcision for the Hebrew infant, but if an abdomen must be opened for other purposes, and the appendix is readily accessible, let it by all means be removed.

The Re-opening of Peebles Hydropathic.

The unfortunate fire which destroyed this institution in 1905 deprived the midlands of Scotland of one of its most favoured sanatoria. Peebles has been for many years regarded as one of the healthiest districts in the country, and as lending itself admirably to the requirements of a resort for the treatment of all cases in which a mild yet bracing climate and an open-air life are of importance. We are glad, therefore, to find that the directors have been fully alive to the loss which the public of both the East and West sustained by being deprived of the benefits of this popular institution, and have lost no time in reconstructing it in a manner which will place it in the forefront of the sanatoria of Scotland.

The fire can, perhaps, not be regarded as altogether a misfortune, since it has enabled the present buildings to be constructed so as to preclude the recurrence of such an accident, while it has also enabled the architect to provide all the comforts and luxury, while conforming to the best hygienic conditions, which are characteristic of modern sanatoria.

Those who visit it purely for pleasure will find abundance of attractions in the opportunities afforded for golf, tennis, cycling, and all other games, while a never-failing source of interest is to be found in the exploration of the beautiful and romantic surroundings.

To the less robust, and those requiring special treatment, the medical baths, Roman, Russian, pine, ozone, brine, and electric, in addition to the fine air and sheltered walks, will, we believe, make the new hydropathic, as heretofore, a valuable adjunct to medical treatment.

ORIGINAL COMMUNICATIONS.

A CLINICAL AND ANATOMICAL STUDY OF THIRTY CERVICAL FIBROIDS REMOVED BY ABDOMINAL HYSTERECTOMY.

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As is well known, the cervix and body of the uterus essentially differ in their anatomical aspects from the earliest periods of the development of the organ. These striking differences they maintain throughout the life of the individual, not only in their anatomical, but also in their physiological and pathological features. Upon such it is not necessary to dwell, except in the essential particular which is associated with the development and growth of uterine fibromyomata, which forms the text of the following observations.

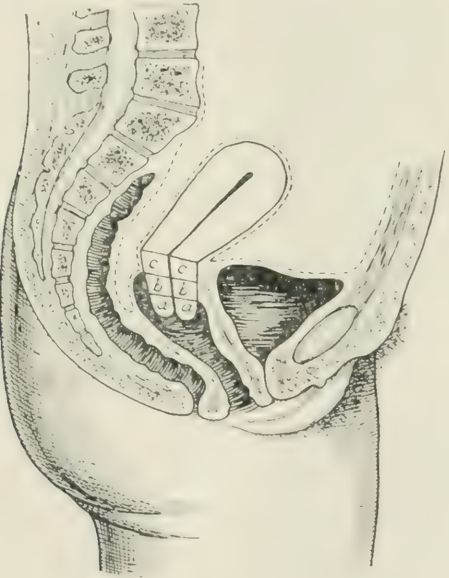

Fig. 1.

The development and growth of these tumours in the cervix is rare, and is said to account for about 5 per cent. only of all cases of uterine fibromyomata. In this connection my operative experience is not in strict accord, as out of 260 cases of hysterectomy for these neoplasms, I have on thirty occasions met with their primary development in this situation. But when the large number of corporeal fibromyomata I have seen, in which operative treatment was unnecessary, is considered, this percentage may fairly be taken as about the normal. At the same time, it must be remembered that submucous cervical fibroids and interstitial tumours of the intra-vaginal portion are by no means rare, and are removable through the vagina.

Divisions of cervix.—To study and classify these growths, one must take into account the anatomical description of the cervix into three portions—supra-, inter-, and intra-vaginal, which is of such great importance in the description of hypertrophic conditions. These may be described as being differentiated from one another by the attachment of the vaginal walls; the "intra" being below the attachment of the anterior vaginal wall, the "supra" being above the attachment of the posterior wall, and the "inter" the intervening portion between these two (Fig. 1). Tumours of the intra-vaginal portion alone do not here call for description, as their removal by the abdominal route, or indeed the removal of the uterus, is uncalled for, and they may thus be dismissed. I therefore confine myself to those associated with the inter- and supra-vaginal portions with subsequent involvement of the intra-vaginal portion.

1. *Table of cases in which cervix alone was involved—*			
(*a*) Supra-vaginal portion . .	Posterior 3 Anterior 1	4	22
(*b*) Supra- and inter-vaginal portion	Posterior 4 Anterior 2	6	
(*c*) Supra-, inter-, and intra-vaginal portions	Posterior 8 Anterior 4	12	
2. *Cases complicated with corporeal fibroids* .	7		7
3. *Cases complicated with one month's pregnancy*	1		1
			30

The supra-vaginal tumours were more of the subperitoneal type, and, with one exception, grew from the posterior wall, and embedded themselves downwards in the recto-vaginal septum. They thus bulged the posterior vaginal wall forwards, but in no way affected the free portion of the cervix, except that it was displaced high up behind the pubis, and was difficult to reach.

Six supra- and inter-vaginal growths were met with, two in the anterior and four in the posterior wall. As the result of the want of involvement of the intra-vaginal portion, the external os was in no way affected, and remained as a slight projection on the base of the tumour, with a small opening at its tip (Fig. 2). All these tumours were sufficiently large to fill the brim of the pelvis, and grew upwards and downwards, assuming the typical ovoid shape. The bladder in all instances was displaced upwards into the abdomen,—in the anterior tumours by the actual growth itself, and in the posterior by the stretching of the anterior wall. In each the growth was incarcerated in the pelvis, and, as might be expected, gave rise to well-marked pressure symptoms, particularly associated with micturition.

The entire cervix was involved in twelve instances. In eight the growth developed in the posterior wall, in four the anterior wall. In these cases, through the stretching and thinning of the uninvolved cervical lip, the os externum was much dilated, and easily admitted the tip of the finger.

All were sufficiently large to fill the true pelvis, and thus conformed to the typical ovoid shape as in the previous tumours.

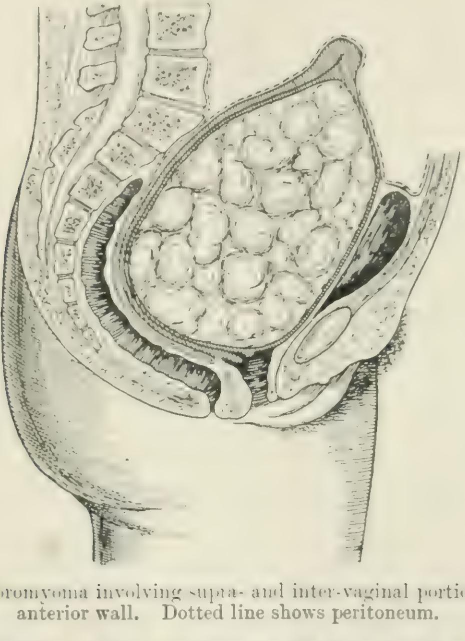

Fig. 2.—Fibromyoma involving supra- and inter-vaginal portions of cervix anterior wall. Dotted line shows peritoneum.

The disposition of the peritoneum is of interest, as it naturally is varied according to the position of the tumour in the anterior or posterior wall. When anterior, the retro-uterine pouch is in no way interfered with, and the peritoneum extends downwards over the upper third of the posterior vaginal wall: while in the posterior tumours the peritoneum is lifted up over the top of the growth, and thus separated from its usual relations to the vaginal roof. In the latter instances the tumour occupied the recto-vaginal septum, and was in close apposition to the rectum and vagina, a relation of very considerable importance with regard to operative removal (Fig. 3). When anteriorly situated, the peritoneum along with the bladder is lifted high in the abdomen, and separated from the anterior abdominal wall for a considerable distance.

In all of the cases but one the growths were uninodular, although in eight instances they were associated with fibromatous nodules in the uterine body. In the multinodular growth which grew from the anterior wall, and involved the entire cervix, the displacement of the surrounding organs was extreme. The bladder was drawn round to the right side of the pelvis, while the fundus uteri was displaced into the retro-uterine pouch. The entire brim of the pelvis was filled by the tumour, and the usual landmarks were thus completely obliterated (Fig. 4).

Clinical features.—As might be expected from the situation and size of the tumours, intra-pelvic pressure symptoms were mainly in evidence. These in the majority of instances were associated with the functions of the bladder, mainly in the direction of retention of urine. Firstly, this was complained of at or about the menstrual period when the tumour was temporarily engorged, but later it occurred at other times; and in one instance it was permanently present; here the irregular pressure on the base of the bladder continued to make catheterisation difficult, as from the prolonged distension of the bladder it remained atonic and pouched, so that unless the catheter actually passed into the upper diverticulum only partial evacuation was procured. Pain, as the result of pressure on the pelvic nerves, is, strangely enough, not a marked symptom; it is by no means so evident as in incarcerated fibroids of the body. Hæmorrhage was a most unequal symptom, and in only ten of the twenty-two cases could be considered severe; seven of these being instances where the entire cervix was involved. In eight there was neither menorrhagia or metrorrhagia.

It is probable in some instances the hæmorrhage was increased by some attempt at the expulsion of the tumour below the mucosa. In this type not only is there a special disposition towards hæmorrhage, but also a tendency to sloughing and gangrene, probably due to some impairment in the blood supply. Hæmorrhage must not, therefore, be considered a constant symptom, although frequently present.

In my own experience, in only two instances did the tumour show any signs of degeneration. These were œdematous and gangrenous. In a case, however, of Professor Simpson's, in which I had the honour of assisting him in its removal, a large central degeneration cyst was present, similar to those met with in the so-called fibrocystic myomata of the uterine body; the contents were spontaneously coagulable on evacuation.

Operation.—The operation for the removal of these growths, though by no means simple, does not present the formidable difficulties which from their situation one would anticipate, as

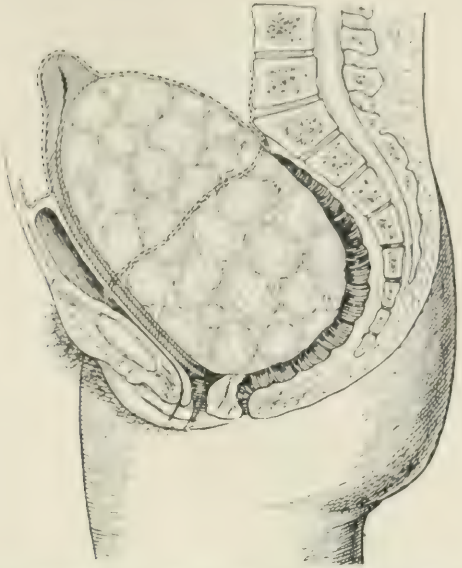

FIG. 3.—Unencapsulated cervical fibroid of posterior wall involving entire cervix. Dotted line shows peritoneum and obliteration of retro-uterine pouch.

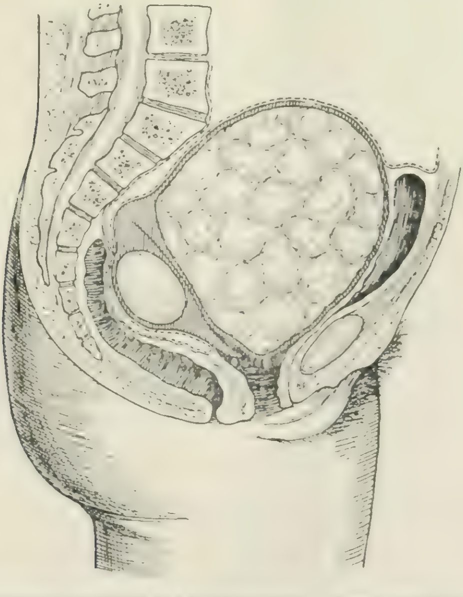

FIG. 4.—Fibromyoma involving the entire cervix. Small nodule in uterine body.

they are usually readily enucleated from their surroundings Perhaps the most troublesome difficulties are the absence of the usual landmarks from the displacement of the surrounding structures, the close relation to the ureters, and the inability to recognise the elongated and stretched uterine arteries. In one case, where the tumour arose from the anterior lip and filled the brim of the pelvis, incarcerating the retroverted fundus with the ovaries in the pouch of Douglas, and pushing the distended bladder far round to the right side, when the abdomen was opened nothing but a large indefinite mass could be seen, which required to be enucleated from its subperitoneal bed before the true relation of parts could be made out (Fig. 4).

As might be expected, the incision in the vaginal wall is preferably to be commenced anteriorly after stripping the bladder down. In a typical case, the following may be described as the method of operating. On opening the abdomen, the small uterine body will be seen situated on the top of the growth. This is laid hold of by a pair of strong vulsella and forcibly pulled upwards. The infundibulo pelvic ligaments are tied and the broad ligament cut. The round ligaments are similarly dealt with. In anterior growths, the loose peritoneum covering the tumour is then incised from pelvic wall to pelvic wall anteriorly, and, with the bladder, is freed from the mass; this is usually easily accomplished, but care must be taken not to tear through the large plexus of vesical veins, which may cause most troublesome hæmorrhage. The uterine arteries are now ligatured as low as possible and divided.

An opening is then made into the anterior vaginal fornix. This is enlarged laterally, extending round the tumour mass, the vaginal wall being gripped in small sections by forceps before cutting. By this means, bleeding from the vaginal arteries, wherever present, is controlled, and they can be easily detected and tied.

When the growth is from the posterior wall, the loose peritoneum covering is incised in like manner and the tumour enucleated from the rectum and its bed, care being taken to keep close to the tumour laterally to avoid the ureters. After enucleation, the anterior vaginal vault is opened and the tumour removed by a process similar to that in the anterior growth. After all vessels have been tied, the bed of the tumour is packed with gauze and the end drawn down into the vagina. The two layers of the peritoneum are now stitched completely over the gauze by continuous thin suture in Lembert fashion. The gauze is withdrawn after forty-eight hours, by which time all oozing has been controlled. The vagina is then gently syringed out daily with warm sterilised water. In supra-vaginal growths, after enucleation the remaining portion of the cervix is cut across and treated by the sub-total method.

In posterior growths, the close connection of the tumour to the rectum from which it has practically been stripped, forms a distinct source of danger, in so far as the bed of the tumour may subsequently become infected by the *Bacillus coli* directly from the bowel. In three of my cases this complication occurred, and in two of these it proved fatal. It is well, therefore, in these instances to see that the bowel is not only freely evacuated but cleansed by means of weak antiseptic enemata.

In cases where there is a distinct muscular capsule to the growth, it is undoubtedly safer to incise it transversely from side to side at the same level as the peritoneal incision, and proceed to enucleate the tumour from the capsule. The cavity which remains is then packed with gauze and the end drawn through the vagina; by this means there is no baring of the rectum, and the risks of infection from this source minimised (Fig. 5).

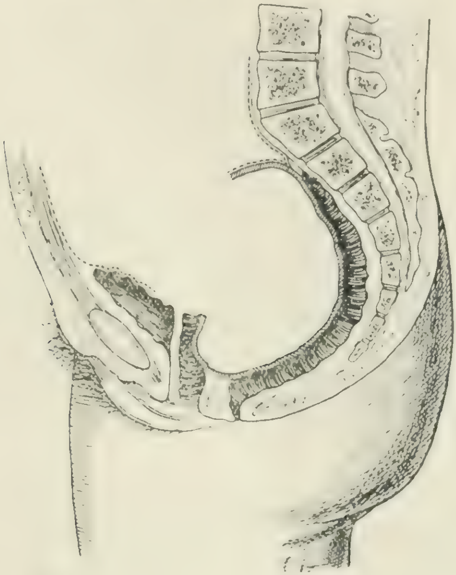

FIG. 5.—Uterus and posterior cervical fibromyoma removed, the latter enucleated from its capsule.

In these cases the tumour may be enucleated after vertically splitting the uterine body and thus reaching the bed of the tumour from above. This is the method adopted by Bland Sutton and Rutherford Morison. A distinct capsule, however, is not always present, and complete removal is essential.

The combination of large corporeal and cervical fibromyomata is, fortunately, rare, and the difficulty and danger of their removal is very great. Personally, I know of no operation in gynæcology which offers so great difficulties, from the want of definite landmarks and the distortion of surrounding important organs. Each case seems more puzzling than the other. The dislocation of the bladder and ureters, the splitting of the layers of the meso-sigmoid, and the want of room to work from the incarceration in the true pelvis, all tend to prevent conventional method of action and demand originality.

Perhaps the most interesting of these it has been my fortune to meet was the removal of the specimen I show of combined fibroid and pregnancy five months, in which labour was present.

I have, unfortunately, to record three deaths in the thirty cases operated upon, a mortality of 10 per cent., which undoubtedly compares most unfavourable with my experience of hysterectomy for corporeal fibroids, which shows a mortality of slightly more than 1 per cent.

That the operation is legitimate, however, even with such results, there can be no gainsaying, as the symptoms present in all cases were severe and dangerous, and doubtless would shortly have caused the death of the individual, a very different status from the victims of corporeal fibroids, in whom the operation is undertaken for discomfort and semi-invalidism, and the life of the patient is only threatened in a comparatively few instances.

Two of the deaths occurred in posterior cases, and were due to septic infection; this was probably predisposed to by the large area of enucleation, which involved baring the rectum. In these cases, therefore, I now always, if possible, enucleate from their capsule, so that stripping from the rectum may be avoided. The third death was also due to septic infection from a sloughing cervical tumour associated with a large corporeal growth.

AMYOTROPHIC LATERAL SCLEROSIS AND PROGRESSIVE MUSCULAR ATROPHY.[1]

By R. T. Williamson, M.D., F.R.C.P., *Assistant Physician, Royal Infirmary, and Lecturer in Medicine, Victoria University, Manchester.*

Gentlemen,—This morning we shall consider four cases of muscular atrophy, two of which are due to amyotrophic lateral sclerosis, and two are probably cases of progressive muscular atrophy. These two affections are very closely allied, and by some neurologists are described as the same disease; but others regard them as separate diseases, or distinct forms of one affection.

Case 1 was that of a man (H. H.), æt. 30, who came under my care in January 1903, on account of wasting of the thenar muscles and of the first interosseous of the right hand. The left hand was not affected at that time. The affected muscles were weak, and the patient had therefore difficulty in following his employment, that of a barber. The weakness and wasting of the muscles mentioned had developed gradually, and had been first noticed a few weeks before he came under observation.

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[1] Clinical lecture, given at the Manchester Royal Infirmary.

There was no history of injury, of alcoholism, or of syphilis, and nothing to account for the symptoms. On examination, in addition to the condition of the hand just mentioned, it was found that the legs were slightly weak, and "dragged" in walking; both knee-jerks were increased; there was slight ankle clonus, and the extensor (Babinski's) type of plantar reflex on the right side; and the wrist-jerks were both increased. There was no anæsthesia, no affection of bladder or rectum, and no sign of spinal caries. The diagnosis of early amyotrophic lateral sclerosis appeared very probable. A few weeks later the thenar muscles of the left hand became affected in the same way as those of the right.

The disease gradually advanced; at the end of eighteen months the patient presented the typical symptoms of amyotrophic lateral sclerosis. There was marked wasting and loss of power of the thenar and hypothenar muscles of each hand, and of the interossei, especially the first. The hands presented a claw-shaped appearance. The muscles of the forearm were atrophied and weak, and both these muscles and the upper arm muscles presented well-marked fibrillary twitchings. The wrist-jerks were both increased.

The movements of the legs were weak, but the patient was able to walk alone. The gait was slightly spastic, the toes being scraped on the ground. There was slight rigidity of the legs on passive movements. The knee-jerks were both increased; there was ankle clonus, and the extensor type of plantar reflex on both sides.

There was no anæsthesia or affection of sensation of any form, except slight aching pains in the arms and neck. The bladder and rectum were not affected, and there were no signs of caries of the spine.

In course of time the atrophic paralysis steadily extended upwards, and both arms hung helpless at the side. The legs became weaker, the spastic condition increased, and walking became more difficult.

Death occurred about three years after the onset of the symptoms. There can be no doubt that the case was one of amyotrophic lateral sclerosis.

Case 2 is that of a female (A. H.), æt. 27, who first noticed weakness and wasting in the left hand, eighteen months before she came under my observation. Soon afterwards the right hand was affected. The wasting of the hand muscles has gradually progressed. There has been no severe pain in the limbs or back, no affection of bladder or rectum, and no anæsthesia. There is no history of injury, alcoholism, or syphilis. The patient has been greatly overworked as a domestic servant.

[The case was then demonstrated to the class.]

You will notice the marked atrophy of the thenar and hypothenar muscles of each hand, and also of the interossei, especially the first. The forearm muscles are also slightly atrophied, and you will see distinctly the frequent fibrillary twitchings of the muscles. The movements performed by the small muscles of the hand are very feeble. In the normal condition the tip of the thumb can be opposed to the tips of the fingers when the phalangeal joints are extended; but you will observe that our patient is quite unable to do this when the phalangeal joints are extended. She cannot quite oppose the top of the thumb to the tip of the fingers, even when the phalangeal joints are flexed, owing to weakness of the thenar muscles. The interossei of the hand in the normal condition act (1) as adductors and abductors of the fingers; (2) they cause flexion of the fingers at the metacarpo-phalangeal joints, and extension at the phalangeal joints. When the interossei are paralysed, adduction and abduction of the fingers cannot be performed. At an early stage, however, extension of the fingers causes a little abduction, and may prevent the loss of power of abduction of the fingers being detected. But weakness of the adductors can be detected early. If a pencil be placed between the thumb and first finger, or between two fingers, and the patient told to fix it by adduction (by pressing together the fingers or the thumb and index finger), it is found that when the interossei are paralysed she is not able to retain it in the position indicated, if an attempt be made to withdraw it. The pencil can be easily pulled away from between the fingers, or from between the thumb and first finger, whilst a healthy individual can fix the pencil firmly in the position just indicated. (You will notice that our patient is able to slightly abduct the fingers, owing to the action of the extensors of the fingers which are not yet paralysed; but when a pencil is placed between the first and second fingers, and at right angles to the fingers, she is not able to hold it tightly in that position by pressing the fingers together, as a healthy individual could do; she is not able to offer any resistance when I attempt to pull the pencil away from between the fingers.) This demonstrates the weakness of the adductors of the fingers (interossei, lumbricales). The other action of the interossei is to place the fingers in a position of flexion at the metacarpo-phalangeal joints, whilst they are extended at the phalangeal joints. Our patient is unable to place the fingers in this position (flexion at the knuckles and extension at the other joints). When the interossei are paralysed, over-action of the opponents of these muscles occur, and the fingers assume a position the opposite of that just described. Therefore there is extension or over-extension at the metacarpo-phalangeal joints, and flexion at the phalangeal joints. This produces a claw-shaped appearance of the hand ("claw-hand," the *main en griffe* of French writers, and *Klauen-hand* or *Krallen-hand* of German writers). Owing to the complete paralysis of the small muscles of the thumb, the over-action of its long extensors often causes the metacarpal bone to be displaced backwards, and to lie in the same plane as the metacarpal bones of the fingers. This is the position of the thumb in the monkey's hand, and in continental works this deformity is described as the "monkey's hand" (German, *Affen-hand*; French, *main de singe*). At an advanced period the muscles of the forearm atrophy; both the flexors and extensors of the fingers become wasted and paralysed. The movements of the fingers cannot be performed. The claw-shaped deformity of the hand disappears, the fingers lie nearly extended, and the hand is like that of a skeleton (*main de squelette* of French writers). You will observe that the hands of our patients present a combination of the deformities I have described—claw-hand and monkey's hand.

[The claw-shaped hand may be observed in many diseases affecting the anterior horns of grey matter in the lowest cervical region,—amyotrophic lateral sclerosis, progressive muscular atrophy, acute and chronic anterior poliomyelitis, and syringomyelia, as well as in other lesions strictly limited to the region mentioned (cervical myelitis, tumour, hæmorrhage). The claw-shaped hand is also observed in lesions of the lower cords of the brachial plexus, in lesions of the ulnar nerve, and occasionally in peripheral neuritis of various forms.]

In our patient, besides the affection of the small muscles of the hands, the forearm muscles are slightly involved. The grasp is feeble, and the wrist movements are slightly impaired. There are well-marked fibrillary contractions of the muscles of the arm. On electrical examination of the small muscles of the hands, a partial reaction of degeneration is obtained, but it is not obtained in the muscles of the forearm.

The *wrist-jerks are increased.* The knee-jerks are increased. There is no ankle clonus, and no extensor type of plantar reflex (Babinski reflex) on the right side, but on the left side occasionally a reflex of the extensor type can be obtained. The gait is not spastic. All the movements of the legs can be performed.

There is no anæsthesia or affection of sensation. The bladder and rectum are not affected.

There is no spinal curvature. In addition to the spinal symptoms described, there are slight indications of bulbar affection: there is slight difficulty in swallowing, the voice has a slight nasal character, there is weakness of the orbicularis oris, and the patient is unable to whistle, though she could do so quite well before the onset of the illness.

At present, therefore, the symptoms may be described as chiefly those of atrophic paralysis of the muscles of the arms, and the case might be regarded as one of progressive muscular atrophy; but though there is now no true spastic condition of the legs, I think it is probable that the case will finally develop into one of amyotrophic lateral sclerosis, and that the legs will become spastic. In favour of this view are the increase of the knee-jerks, and especially the *increase of the wrist-jerks.* In progressive muscular atrophy the wrist-jerks are usually lost. Then there are the slight indications of bulbar symptoms. According to some neurologists, bulbar symptoms point to amyotrophic lateral sclerosis, and do not occur in true progressive muscular atrophy.

[Eight months have elapsed since this description was written. The legs have now become spastic, the knee-jerks are increased; on both sides ankle clonus, Babinski's extensor type of plantar reflex and Oppenheim's reflex are present. Rectus clonus can sometimes be obtained. The bulbar symptoms are more marked. So that the diagnosis of amyotrophic lateral sclerosis is now certain.]

The chief pathological changes in amyotrophic lateral sclerosis[1] consist in degeneration (sclerosis) of the lateral pyramidal tracts in all three regions of the cord—cervical, dorsal, and lumbar—with degeneration of the nerve cells and fine network of nerve fibres in the anterior horns of grey matter in the cervical region (see

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[1] See writer's review, *Med. Chron.*, Manchester, 1901, November, p. 137.

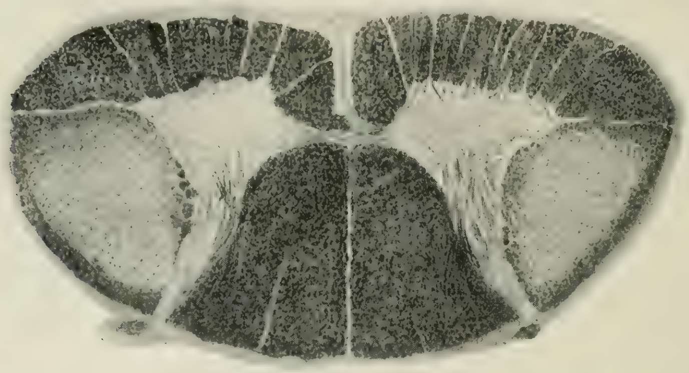

FIG. 1.—Section of the spinal cord in the lower cervical region in a case of amyotrophic lateral sclerosis, Weigert's stain: normal nerve fibres black, degenerated parts pale. *Note* pale degenerated area in each lateral column. Degeneration affects the crossed pyramidal tracts, and *also* extends to antero-lateral white matter just in front of this tract (see text). In the anterior horns of grey matter the fine nerve fibres are absent, whilst fine normal fibres are seen running from the posterior horn to the median grey matter. (Under the high power of the microscope the nerve cells of the anterior horns were found to be absent or atrophied.)

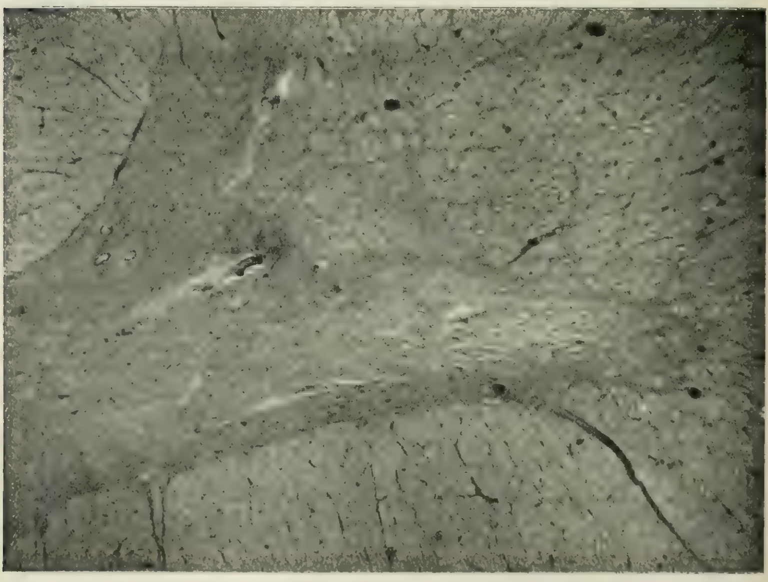

FIG. 2.—Microphotograph of anterior horn of grey matter, lower cervical region, amyotrophic lateral sclerosis. Nerve cells absent.

Figs. 1 and 2). In the lumbar region the changes in the anterior horns are absent or very much less than in the cervical region (see Fig. 8). The degeneration in the lateral white matter is most marked in the crossed or lateral pyramidal tracts, but often there is also a diffuse slight degeneration in the antero-lateral white matter around and anterior to these tracts.

The degeneration in the lateral pyramidal tracts in some cases ceases at the medulla; in others it can be traced upwards to the pons, or to the internal capsule; and in others to the motor area of the cervical cortex. A number of cases have been recorded in which the motor cells (large pyramidal cells) of the motor cortex have also been degenerated.

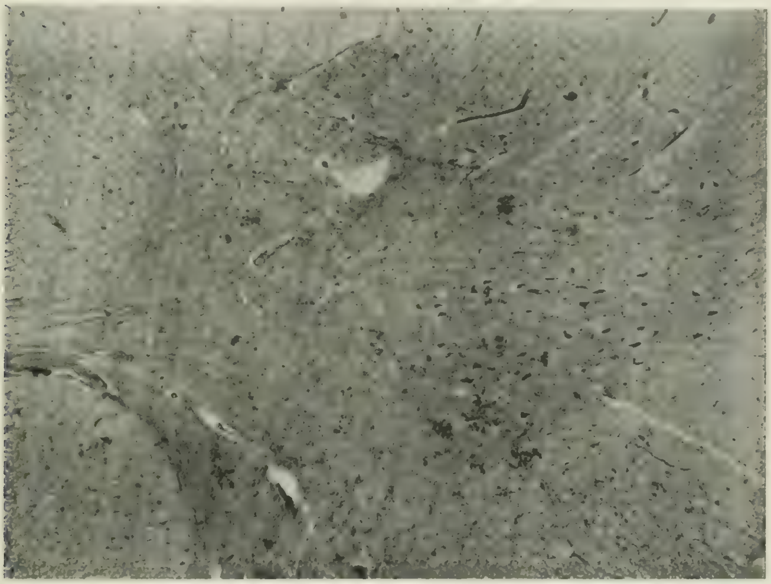

Fig. 3.—Microphotograph of normal anterior horn of grey matter, lower cervical region. Nerve cells numerous and distinct (black).

Degeneration of the anterior nerve roots has been found in the cervical region, and in some cases also in the peripheral motor nerves down to the muscles.

Hence in marked cases there is degeneration of the whole upper and lower motor neurons at the cervical region of the cord (see Figs. 7 and 8). The paralysed and atrophied muscles are also degenerated, and present the same changes as those in progressive muscular atrophy, which I shall shortly mention.

Case 3.—The third case which I have to describe to you is that of a man who attended the Manchester Royal Infirmary as an out-patient for many years. He was under the care of the late Dr. Leech, and on many occasions I had the opportunity of observing the distribution of the paralysis. Death occurred twenty years after the onset of the disease. Dr. Leech kindly gave me the spinal cord for examination, and I have already published a report of the pathological changes.[1]

I first saw the patient when a student in 1879. Both arms were then paralysed. I last examined the man, along with Dr. Leech, in 1898. Death occurred twelve months later.

The symptoms were those of slowly progressing muscular atrophy, with paralysis, affecting all the muscles of the hands and arms, and finally the muscles of the neck. For many years the arms hung helpless by the sides, and the head was bent forwards. There was no affection of sensation, and the bladder and rectum were not affected. There were no symptoms of bulbar paralysis. When I last examined him, more than twenty years after the onset of the disease, and only twelve months before his death, there was no spastic condition of the legs, the knee-jerks were present, there was no ankle clonus, the patient could walk quite well, and the legs were unaffected. All the muscles of the arms were atrophied and paralysed. There was thus *no evidence of amyotrophic lateral sclerosis at the end of twenty years.* The symptoms corresponded to those of progressive muscular atrophy of the Aran-Duchenne type, as described in the older text-books, and on pathological examination of the spinal cord I found that the condition confirmed

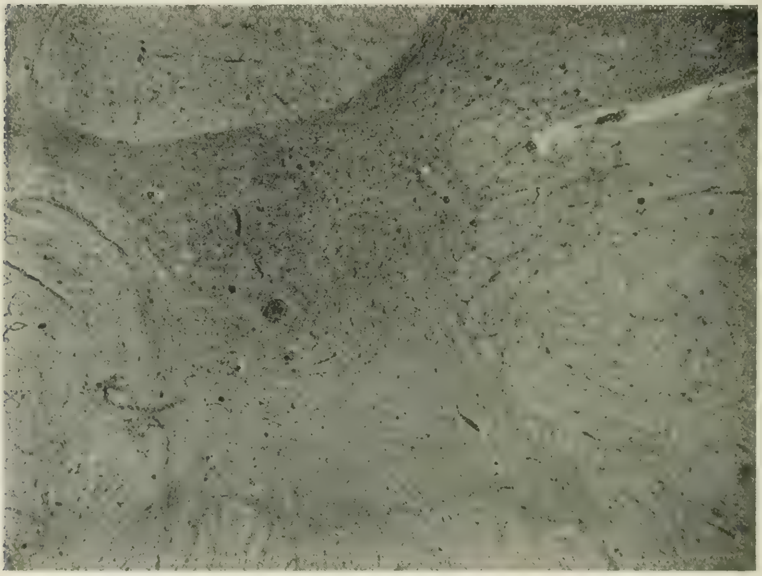

FIG. 4.—Microphotograph of anterior horn of grey matter, lower cervical region; progressive muscular atrophy. Nerve cells absent.

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[1] *Lancet*, London, 1901, July 6.

this diagnosis. Pathologically, there was no evidence of sclerosis in the crossed pyramidal tracts, *i.e.* no evidence of amyotrophic lateral sclerosis. Briefly stated, the changes consisted in complete atrophy of the nerve cells of the anterior horns of grey matter in the cervical region (see Fig. 4). The fine nerve fibres in the anterior horns of grey matter in the cervical region had mostly disappeared, and only a few of these fibres remained; but in the posterior horns they were normal (see Fig. 5). The anterior horns of grey matter were smaller than in the normal condition. The crossed and direct pyramidal tracts of the antero-

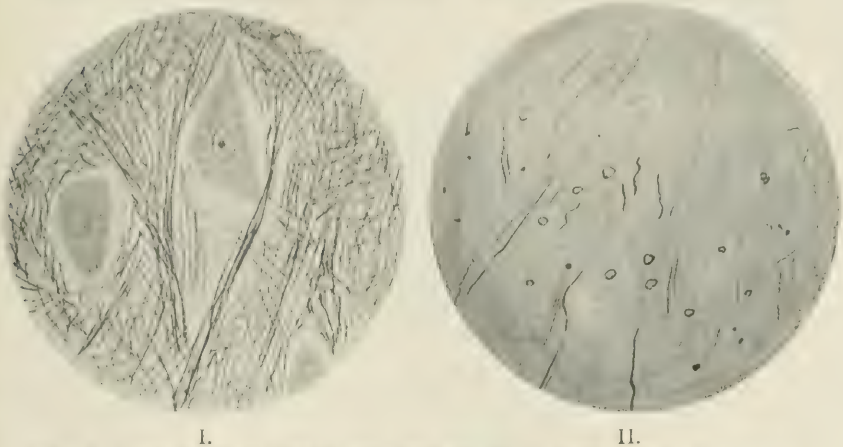
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FIG. 5.- Anterior horn of grey matter (lower cervical), Weigert's stain. I. Normal, showing numerous fine nerve fibres and two nerve cells. II. Anterior horn in progressive muscular atrophy (same method of staining), nerve fibres very scanty, nerve cells completely degenerated.

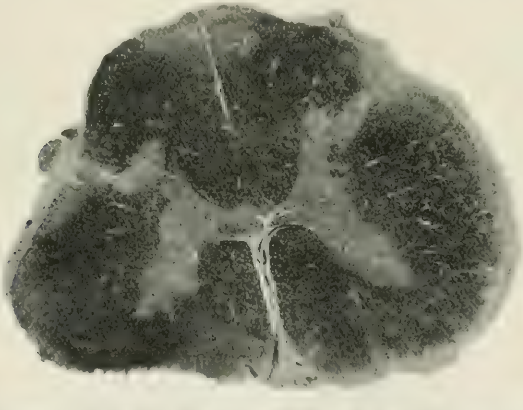
FIG. 6.- Photograph of section of spinal cord (cervical region) progressive muscular atrophy, Weigert's stain. Note absence of degeneration in the crossed pyramidal tracts.

lateral white matter presented *no sign of sclerosis or degeneration* (see Fig. 6).

The anterior nerve roots were markedly atrophied, the posterior were normal. The muscle fibres of the affected muscles had entirely disappeared.

This case clearly demonstrates that there is a form of spinal muscular atrophy which may run its entire course without spastic paralysis or paresis of the legs developing, *i.e.* that there is a form of disease corresponding to the older description of progressive muscular atrophy (Aran-Duchenne type) which does not finally terminate in amyotrophic lateral sclerosis. Also the case demonstrates that pathological changes in such cases may be localised to the anterior horns of grey matter; that the crossed pyramidal tracts may be quite normal; and that pathologically the lesion is a chronic anterior poliomyelitis. Both clinically and pathologically, therefore, the case differed from amyotrophic lateral sclerosis, and corresponded to the spinal progressive muscular atrophy of the Aran-Duchenne form, as described in the older text-books.

Case 4.—The last case I have to demonstrate to you is that of Alice R., æt. 42. For two years she has noticed steadily increasing weakness of the upper part of the arms, and difficulty in raising the arms at the shoulders. There is no history of injury or of syphilis. Pain, numbness, and sensory symptoms have been absent.

Examination reveals marked wasting of the deltoid on each side. There is also slight wasting of the biceps on each side, but the forearm muscles and the muscles of the hands appear quite normal. There are well-marked fibrillary contraction in the deltoid, biceps, and upper arm muscles on each side. The patient is unable to raise the arms at the shoulders, except to a very slight extent. She is quite unable to raise the arm to a position at right angles to the trunk. All the movements performed by the deltoid are markedly impaired: those on the right side are more affected than those on the left. There is also marked weakness of the biceps and supinator longus on the right side, and slight weakness of the triceps. On the left side there is slight weakness of the biceps.

The pectorals, trapezius, sterno-mastoid, forearm and hand muscles are unaffected on both sides. The *wrist-jerks are both absent.* The triceps-jerks are present. The deltoid and biceps muscles do not yet present any reaction of degeneration on electrical examination.

There is no affection of the leg muscles, no spastic gait or spastic condition of the legs, and the reflexes of the legs are normal. There are no pains and no sensory symptoms in the arms, legs, or trunk.

The bladder and rectum are not affected.

The symptoms in this case are therefore entirely motor, and consist chiefly of atrophic paralysis of the deltoid, biceps, and supinator longus on the right side, and of the deltoid and biceps on the left.

I believe this case to be one of progressive muscular atrophy commencing in the upper arm muscles.

Idiopathic muscular atrophy affects the same muscles, but the onset is usually much earlier in life. Usually idiopathic muscular atrophy commences under 20, whilst our patient was 40 when the symptoms were first noticed. In idiopathic muscular atrophy several members of a family are often affected, but no other member of the family is affected in our case. Fibrillary contractions do not occur in idiopathic muscular atrophy: they are well marked in our patient.

The onset of the affection has been very gradual in the case I have just demonstrated to you. There have been no sensory symptoms, and no evidences of spinal caries. The absence of the wrist-jerks, whilst the triceps jerks are present, is a point against amyotrophic lateral sclerosis and in favour of progressive muscular atrophy.

I think we may conclude that the case is *probably* one of progressive muscular atrophy commencing in an unusual manner in the upper arm muscles.

These cases are examples of two rare diseases. Though they are probably closely allied, and possibly forms of one pathological process, still the results of the microscopical examination in the third case furnish, I think, clear evidence that there are two separate diseases, or two distinct forms of one affection, to which the names of amyotrophic lateral sclerosis and progressive muscular atrophy may be respectively applied.

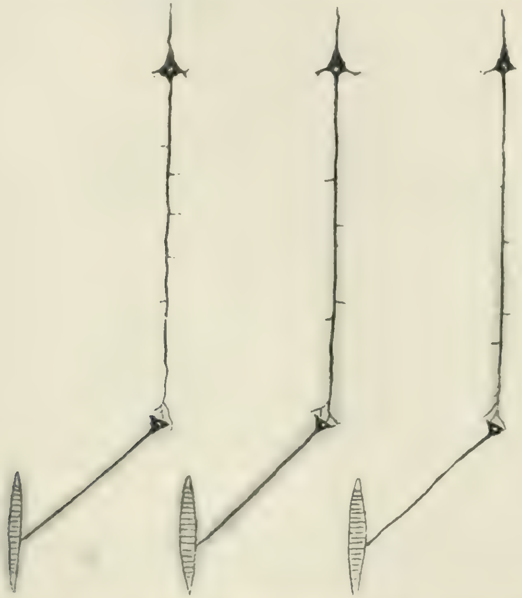

FIG. 7.—Upper and lower motor neurons and muscles. Degenerated portions of neurons and degenerated muscles are shaded. Neurons in progressive muscular atrophy to the left; in amyotrophic lateral sclerosis in the centre; in primary lateral sclerosis to the right.

The diagrams (Fig. 7) demonstrate the localisation of the changes. The upper and lower motor neurons and muscles are indicated. The upper motor neuron is the nerve cell in the motor cortex of the brain and its axon passing down in the crossed pyramidal tracts of the spinal cord. The lower motor neuron is the nerve cell in the anterior horn of grey matter and its axon passing into the motor nerve root and thence to the muscles. Now, in progressive muscular atrophy the degeneration in the nervous system is localised to the lower motor neurons—the cells in the anterior horn and the nerve fibres proceeding therefrom. In amyotrophic lateral sclerosis the lower motor neuron is degenerated in the same manner in the cervical region ; but in addition the upper motor neuron is affected, the degeneration involving the axons of these neurons in the cord. Sometimes the degeneration extends up to the medulla, the internal capsule, or even to the motor cells in the cortex. The lower motor neuron is not affected in the lumbar region (see Fig. 8), or affected only at a late stage of the disease.

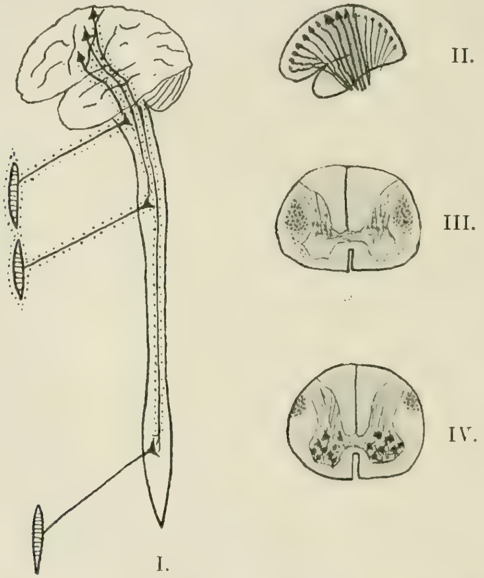

Fig. 8.—Diagrams showing seat of lesions in amyotrophic lateral sclerosis.
I. Brain and cord showing upper and lower motor neurons for arm, leg, and bulbar muscles. Neurons which are diseased are marked with dots.
II. Diagram indicating degeneration of motor fibres and motor cells of cerebral hemisphere (deeply shaded).
III. Cervical region of cord: degeneration (marked by dots) of crossed pyramidal tracts and slight degeneration anterior to these tracts. Absence of nerve cells and fine nerve fibres in anterior horn of grey matter.
IV. Lumbar region of cord: degeneration in crossed pyramidal tracts (marked by dots). Cells and fine nerve fibres in anterior horns normal.

Often the clinical diagnosis of progressive muscular atrophy can only be regarded as a probable one, since cases which at first have presented the features of this disease have developed the symptoms of amyotrophic lateral sclerosis at a later period; and in rare instances an affection which has appeared to be due to progressive muscular atrophy during life has proved to be amyotrophic lateral sclerosis on pathological examination.

The paralytic condition of the arms is similar in many respects in both diseases; but the following are important points in the differential diagnosis of the two affections:—

1. In favour of amyotrophic lateral sclerosis would be a spastic condition of the legs—spastic gait, scraping of the toes in walking, rigidity of the legs on passive movements, increased knee-jerks, ankle clonus, and the extensor type of plantar reflex, Babinski's reflex (see Case 1). These symptoms are all absent in true progressive muscular atrophy (see Case 3).

2. Symptoms of bulbar paralysis would be in favour of amyotrophic lateral sclerosis. According to Dejerine, bulbar symptoms do not occur in true progressive muscular atrophy (see Case 2).

3. Amyotrophic lateral sclerosis, as a rule, runs a more rapid course than progressive muscular atrophy. According to Dejerine, the duration of the disease in progressive muscular atrophy is often very chronic—ten, fifteen, or twenty years (see Case 3); whilst in amyotrophic lateral sclerosis the disease usually terminates fatally in from one to four years (see Case 1), though a few exceptional cases of longer duration have been recorded.

4. The increase of the wrist-jerks is in favour of amyotrophic lateral sclerosis: loss of this reflex is in favour of progressive muscular atrophy (see Case 4).

5. Paresis or paralysis in muscles which are not yet definitely atrophied is in favour of amyotrophic lateral sclerosis and against progressive muscular atrophy.

ACUTE DILATATION OF THE STOMACH AND INTESTINES IN A CASE OF MULTIPLE PERIPHERAL NEURITIS.

By F. PARKES WEBER, M.D., F.R.C.P., *Physician to the German Hospital, London, and the Mount Vernon Hospital for Consumption, Hampstead.*

THE patient, William F., æt. 50, a night watchman, formerly a police constable, was admitted at the German Hospital, under Dr. Parkes Weber, on 16th November 1906, on account of paralysis of the hands and feet.

The present illness began about fourteen days before admission with pain in the calf muscles. Then the feet became swollen and paralysed, and afterwards he suffered from shooting pains in both forearms, and lost all power in both hands. He had a sensation of "pins and needles" in the extremities before, during, and after the development of the paralysis.

Formerly he is said to have enjoyed good health, and to have been rather a big eater, but, though a "thirsty man," he claims to have been moderate in regard to alcoholic drinks (see later on, however). No history of syphilis. Has never had anything to do with lead or arsenic. No history of similar affection amongst his friends with whom he has been accustomed to drink beer.

CONDITION ON ADMISSION.—Big, rather obese man, with a somewhat bloated-looking face. The cardiac apex beat is felt in the fifth space outside the nipple line; the heart sounds are soft; no murmur can be heard. The lungs show nothing abnormal. The liver and spleen cannot be felt (but the abdominal parietes are very fat). Temperature, 101° F. Pulse, 100; regular. Pupils react to light and accommodation. The urine is of specific gravity 1022, clear, acid, and free from albumin and sugar.

Upper extremities.—The hands, which are in the "drop-wrist" position, are quite paralysed. On the left side the patient can with difficulty bend his arm at the elbow-joint, but on the right side he cannot even do this. There is anæsthesia over the back of both hands.

Lower extremities.—The feet are in the typical "drop-foot" position, and there is paralysis of the muscles in front of the legs. Sensation is affected in the region supplied by the anterior branch of the external popliteal nerve. Patellar and plantar reflexes are absent. The sphincters are not affected.

The patient was given milk diet with two eggs, and 5 minims of liquor strychninæ hydrochloratis three times daily. On the morning of 21st November the house-physician, who found the heart's action weak and slightly irregular, gave him 10 minims of tincture of digitalis.

November 21, 1906.—The patient has till now presented no threatening symptom, and has been lying quietly in bed. The temperature has varied between 98°·8 and 101° F., and the pulse between 100 and 110. The daily amount of urine has averaged 1370 c.c. In the afternoon, to-day, the patient complained of pains in the umbilical region, and at about 4.30 P.M. the pains spread over the gastric area. Suddenly he felt sick, and began about 5.30 P.M. to vomit fluid containing blackish material suspended in it, and giving the guaiac reaction (Weber's method) for blood. In the evening (21st November) —Pulse, over 130 in the minute, irregular, sometimes "thready." The abdomen is distended and tympanitic, and slightly tender to palpation. The bowels had acted copiously (fluid motion) a little after 4 P.M. Per rectum nothing abnormal could be felt, and the abdominal distension was not relieved by the passage of a rectal tube. There was repeated vomiting, and an increasing condition of collapse.

My surgical colleague, who was summoned, amongst various possibilities thought of acute hæmorrhagic pancreatitis, and determined on a laparotomy. The general condition appeared to be somewhat improved by a preliminary washing out of the stomach, but after inhaling a little ether the patient died suddenly, before the operation was commenced.

At the necropsy on the following morning (22nd November), the large and small intestines and the stomach were found uniformly distended with gas. The stomach was not specially distended (but one must remember that it had been washed out just before death). The gastric mucous membrane was anæmic, pigmented, and thickened, suggesting previous chronic catarrh, but no trace of blood was found in either the stomach or intestines, and there were no varicose veins in the stomach or the lower part of the œsophagus. The diaphragmatic vault reached on the right side up to the fourth rib, on the left up to the fourth intercostal space. The liver was large and fatty, weighing 100 oz.; macroscopically there appeared to be a slight increase in the connective tissue elements, and microscopical examination revealed a decided, though early, stage of cirrhosis. The spleen, pancreas, kidneys, and suprarenal glands showed nothing special. There was no obstruction in the rectum. Beyond the great distension of the bowels, nothing was found to account for the abdominal symptoms. The lungs showed some œdema. The heart was fairly uniformly hypertrophied, and weighed 20 oz. It was somewhat dilated, and the muscle substance was flabby and easily torn. There was no valvular disease, and only a moderate amount of aortic atheroma. My best thanks are due to the house-physician, Dr. Daser, for his help in the examination of the case.

The case seems to me to be one of acute gastro-intestinal dilatation with cardiac weakness supervening in the course of polyneuritis (alcoholica?). The fact that the stomach was not found to be specially distended after death may be accounted for by its having been emptied shortly before death. Unfortunately, the nervous system was not examined after death, but considering the extent of the peripheral neuritis it is possible that the pneumogastric nerve may have been affected as well as the nerves of the four limbs, and that the involvement of the pneumogastric nerve caused atony of the stomach and intestines, and thus acted as a predisposing cause of the acute gastro-intestinal dilatation.

When I was house-physician to Sir Dyce Duckworth in 1891 at St. Bartholomew's Hospital, a dock labourer, æt. 33, who had formerly been a drinker, developed multiple peripheral neuritis after typhoid fever. The neuritis in that case chiefly affected the upper extremities, and was at one time accompanied by very troublesome vomiting. According to Carion and Hallion,[1] section of the pneumogastric nerves in the dog may cause dilatation of the stomach and part of the œsophagus, and H. Campbell Thomson[2] writes: "It is probable that such a paralytic condition . . . is closely allied in its causation and nature to the paralytic distension of the intestines which frequently occurs after severe abdominal operations, even when there is no peritonitis present."[1] On these grounds, one would expect to find records of acute gastro-intestinal distension supervening in severe cases of polyneuritis, but as yet I have heard of no case of the kind except the present one, unless indeed troublesome vomiting in the course of polyneuritis, such as occurred in Sir Dyce Duckworth's patient with neuritis after typhoid fever, be regarded as analogous from the ætiological point of view.

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[1] Reported in the *Semaine méd.*, Paris, 1895, August 21, p. 379. See also Hugo Starck, "Experimentelles ueber motorische Vagusfunktion," *München. med. Wchnschr.*, 1904, August 23, p. 1512. Cerebral disorders may, of course, by way of the pneumogastric nerves cause symptoms referable to the stomach or œsophagus. In a man, æt. 50 (Strauss, *Berl. klin. Wchnschr.*, 1898, September 19, No. 38, p. 841), with symptoms of obstruction at the cardiac orifice of the stomach, nothing could be found at the necropsy to account for the obstruction, excepting chronic internal hydrocephalus; this must therefore be supposed to have caused spasmodic obstruction at the lower end of the œsophagus.

[2] "Acute Dilatation of the Stomach," London, 1902, p. 46.

THE ELECTRICAL CONDUCTIVITY OF THE BLOOD AND URINE IN HEALTH AND IN DISEASE, AND AS A TEST OF THE FUNCTIONAL EFFICIENCY OF THE KIDNEY.[2]

By DAWSON TURNER, M.D., F.R.C.P.Ed., *Lecturer on Physics, Surgeons' Hall, Edinburgh.*

IN making electrical measurements it is customary to refer to the resistance of a conductor rather than to its conductivity. If the conductivity be referred to numerically, it is expressed as the reciprocal of the resistance.

In a communication made to the Royal Society of Edinburgh on 21st December 1891, in a communication to this Society in July 1892, and in a further communication to the Physiological Section of the British Association, the author has given accounts of the experiments he had made to ascertain and compare the electrical resistances of various kinds of urine both in states of health and of disease. To avoid polarisation, the measurements were made by means of a Wheatstone's bridge with alternating currents and a telephone, and at a temperature of 65° F.

It would appear from the observations, now some thousand in number, that the observed resistance of a normal urine amounts to about 250 ohms in this apparatus (specific resistance, 42·5 ohms), and from experiments on artificial urines it was found that the resistance depends only upon the ionic concentration, *i.e.*, upon the salts, acids, and bases, and of these NaCl is by far the most important; the resistance for practical clinical purposes can be regarded as being unaffected by the presence of albumin, sugar, blood, and other non-electrolytes.

The table shows that the effect of urea (Table 1) in lowering

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[1] A similar explanation could be offered for cases of acute gastro-intestinal dilatation associated with pneumonia and pleuro-pericarditis, but I doubt its being the most satisfactory explanation in the case I recorded at the Clinical Society recently (cf. "Acute Dilatation (Acute Atony) of the Stomach and Intestines connected with Pneumonia and Pleuro-pericarditis," *Trans. Clin. Soc. London*, 1906, vol. xxxix. p. 205).

[2] Read before the Edinburgh Medico-Chirurgical Society, January 16, 1907.

Tables of Electrical Resistances of Artificial Urines at 65° F.

TABLE 1.—UREA IN DISTILLED WATER.

Strength.	Resistance.	
	Observed.	Specific.
3 per cent . . .	2,250	382·5
2 ,, . . .	3,350	568·5
1 ,, . . .	5,750	977·5
0·5 ,, . . .	10,500	1785

TABLE 2.—SODIUM CHLORIDE.

Strength.	Resistance.	
	Observed.	Specific.
2 per cent . . .	175	29·25
1 ,, . . .	375	63·75
0·75 ,, . . .	470	79·9
0·5 ,, . . .	650	110·5

TABLE 3.—UREA AND SODIUM CHLORIDE.

Urea.	Sodium Chloride.	Resistance Observed.
3 per cent	1 per cent.	325
2 ,,	1 ,,	340
1 ,,	1 ,,	340

TABLE 4.—GRAPE SUGAR AND SODIUM CHLORIDE AND UREA.

Urea.	Sodium Chloride.	Sugar.	Resistance Observed.
2 per cent.	1 per cent.	8 per cent.	400
2 ,,	1 ,,	4 ,,	350
2 ,,	1 ,,	2 ,,	350

the resistance is trifling as compared with the effect of sodium chloride (Table 2), and that when the two are dissolved together in distilled water the resistance depends upon the sodium chloride present, and is but slightly affected by increasing the urea present from 1 to 3 per cent (Table 3).

Table 4 shows that when a large amount of grape sugar is present, the resistance is a little raised by the increased viscosity.

In health the resistance is low, and the lower it is, other things being equal, the healthier the condition.

In certain acute and chronic diseases a very high resistance is found constantly present.

Acute croupous pneumonia is an example of the former, and diabetes mellitus of the latter, but the resistance is also high in kidney disease and in pernicious anæmia, while I have found that the urine passed during an attack of sick headache may have double its normal resistance.

TABLE 5.—*Observed and Specific Electrical Resistances in Various Urines.*

No.	Disease.	Specific Gravity.	Reaction.	Temperature.	Urea in Grs. per oz.	Albumin.	Sugar in Grs. per oz.	Observed Resistance (Ohms).	Specific Resistance (Ohms).
1	0	1026	Acid.	65	11·0	0	0	185	31·45
2	0	1024½	,,	,,	11·7	0	0	185	31·45
3	0	1027	,,	,,	10·29	0	0	195	33·15
4	0	1027	Neutral.	,,	12·16	0	0	215	36·55
5	0	1027	Acid.	,,	13·1	0	0	227	38·59
6	0	1017	Neutral.	,,	7·4	0	0	258	43·86
7	0	1012	Acid.	,,	4·21	0	0	370	62·9
8	0	1009	,,	,,	5·85	0	0	435	73·9
9	0	1010	,,	,,	1·5	0	0	700	119·0
10	Exophthalmic goitre	1005	,,	,,	1·4	0	0	900	153·0
11	Diabetes mellitus	1034	,,	,,	4·68	0	25	920	156·4
12	,, ,,	1034	,,	,,	6·08	0	27	820	139·4
13	,, ,,	1034½	,,	,,	5·6	0	30	775	131·75
14	,, ,,	1034	,,	,,	6·08	0	27	760	129·2
15	,, ,,	1040	,,	,,	8·1	0	28	732	124·41
16	,, ,,	1025	,,	,,	6·08	Trace	14	540	91·8
17	,, ,,	1036	,,	,,	13·1	0	17	320	54·4
18	Artificial diabetes[1]	1040	,,	,,	10·76	0	30	220	37·4
19	Acute Bright	1011	,,	,,	4·0	Blood	0	675	114·75
20	Pernicious anæmia	1014	,,	,,	7·72	0	0	680	115·6
21	Apical pneumonia	1025	,,	,,	13·5	0	0	525	89·25

[1] 30 grs. of grape sugar per oz. added to a normal urine.

Within the last ten years, the author has made many attempts to measure the electrical resistance of the blood ; various methods (dilution with distilled water, measurement of the resistance of a column of blood in a capillary tube, etc.) have been employed and subsequently rejected. The principal difficulty depends upon the fact that only very small quantities of blood can generally be obtained at one time. The best and most recent results were obtained by placing 5 c.mm. of freshly drawn blood between two cup-shaped electrodes, 3 mm. in diameter, coated with spongy platinum, and fixed at 2 mm. apart.[1] The length of the cylinder of blood between the electrodes is of less importance than its diameter, because the cross-sectional area varies with the square of its diameter, and the resistance of a conductor varies directly as its length and inversely as its cross-sectional area. By employing electrodes of fixed diameter and at the same distance apart, and the same quantity of blood for each observation, and by making the measurement at once before such changes as coagulation or evaporation could occur, fairly consistent results were obtained. Still, as in all blood-measuring operations, practice and the personal equation come in.

The average observed resistance of normal blood measured in this way is 900 ohms, but it may fall to 700 or rise exceptionally to 1600 (specific resistance about 150 ohms). The resistance depends again upon the salt concentration of the blood and upon the relative volume of the corpuscles to the serum.[2]

These have opposite effects. Thus the greater the salt concentration the lower the resistance, but the greater the number of red cells present the higher the resistance. A blood of high resistance indicates that the proportion of salts in the blood is small, or that the proportion of corpuscles present is large. Hence a high resistance of the blood but a low resistance of the urine is indicative of health.

Changes are to be observed in disease, and those changes are in the direction of a diminished resistance. Thus in kidney disease, in chlorosis, anæmia, and in pernicious anæmia the resistance will be found to be low, and sometimes, as in pernicious anæmia, very low, even to less than half that of normal blood.

In these conditions the blood, we must conclude, contains fewer blood corpuscles, or more salts, or both.

We can throw light on this question by counting the blood corpuscles, and by examining the resistance of the urine. The latter will, as already explained, be found to be high. Dr. F. C. Hopkins[3] reports that the salts were deficient in the urine in five cases of pernicious anæmia which he examined.

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[1] Wilson, *Am. Journ. Physiol.*, 1905, March, has shown (using a small glass apparatus) that the resistance of serum from clotted blood is the same as that of the corresponding plasma, and that unclotted blood and defibrinated blood have the same resistance.

[2] The author desires to express his indebtedness to Professor G. N. Stewart and to Mr. T. M. Wilson for drawing his attention to the part the blood corpuscles play in altering the blood resistance, and to Mr. Wilson's conductivity measurements and cryoscopic observations.

[3] *Guy's Hosp. Rep.*, London, 1891.

Proceeding in this way, the author was led to compare systematically the resistance of the blood and the resistance of the urine, and to originate a ratio which, after consultation with Dr. G. Gibson, he has termed the "hæmorenal salt index," or the ratio of the electrical resistance of the blood to the electrical resistance of the urine.

In health, this would be equal to 3, 4, or 5 whole numbers, namely, $\frac{900}{225}=4$.

The higher this number is, the healthier, other things being equal, is the condition of the patient.

If the index increases, it indicates that the blood contains fewer salts or is richer in corpuscles, and that the urine contains more salts, and that the functional activity of the kidney is increasing; if the renal index diminishes, then the kidney is becoming sluggish and less efficient.

The following are notes of some surgical cases:—

Case of Mr. Cathcart's.—*Enlargement of one kidney.*—Question of removal? Resistance of the blood was 900 ohms, which was normal. Resistance of the urine was 300 ohms, which was also about the normal.

The hæmorenal index was $\frac{900}{300}=3$.

This was quite a satisfactory figure, and it agreed with the cryoscopic investigation. The cryoscopic figure was 0·585. Mr. Cathcart has since removed the diseased kidney, which was the seat of a malignant tumour, and the patient is making a good recovery, and his other kidney has given rise to no anxiety; he has passed from 20 to 60 oz. of urine a day.

Case of Dr. Gibson's and Mr. Caird's.—*Cystitis.*—M. M., æt. 30. Urine segregated. Index of left kidney, 1. Index of right kidney, 3·7. The urine in this case was measured both before and after the injection of indigo-carmine, and it was found that the blue coloration of the urine of the right kidney did not affect the electrical resistance.

Case of Dr. A. Thomson's.—*Surgical case of tuberculous kidney.*—Secretions examined by Dr. A. C. T. Woodward. The resistance of the blood was normal, namely, 900 ohms, showing that the salts of the blood were being properly eliminated. The resistance of the urine (not coloured blue) segregated from the left diseased kidney amounted to 550. The urea was 2 grs. per oz. The resistance of the urine (coloured blue) segregated from the right healthier kidney was 370. Urea, 7·5 grs. per oz.

The hæmorenal salt index of the diseased kidney was $\frac{900}{550}=1{\cdot}6$.

The hæmorenal salt index of the healthier kidney was $\frac{900}{370}=2{\cdot}4$.

Operation showed that the left kidney was tuberculous; when this was removed the patient recovered.

CASE OF MR. CAIRD'S.—*Disease of right kidney.*—Date, December 22, 1906. Patient, W., æt. 37. Question of removal? The resistance of the blood was 1060, which was normal. The resistance of the urine segregated from the right diseased kidney (four specimens examined) was 330 ohms. The urea was 5 grs. per oz. Pus cells were present. The resistance of the urine segregated from the left healthy kidney (four specimens examined) was 235 ohms. Urea, 7·5 grs.

The hæmorenal index of the right kidney was $\frac{1060}{330} = 3{\cdot}2$.

This is a satisfactory index, and it shows the kidney is capable of doing useful work.

The hæmorenal index of the left kidney was $\frac{1060}{235} = 4{\cdot}5$.

This is a very satisfactory index; it indicates that the kidney is very efficient, in fact about one and a half times as efficient as the right kidney, and that therefore operation on this account was not contra-indicated. Operation showed that the right kidney, though containing good kidney substance, yet was the seat of so many small calculi (practically a mass of sand) that removal of the entire kidney was necessary. Since the operation the patient has done very well, and has now, I believe, gone home.

CASE OF MR. COTTERILL'S.—*Probable disease of left kidney.*—Date, January 10, 1907. Patient, J. S., æt. 24. Question of removal? The resistance of the urine segregated from right healthy kidney (four specimens, two coloured indigo-carmine) was 371 ohms. The resistance of the urine, one specimen, segregated from the left kidney was 675. The resistance of the blood was 960.

The hæmorenal index of the right healthy kidney was $\frac{960}{371} = 2{\cdot}5$.

This is below the normal, and it indicates that the kidney is not very efficient.

The hæmorenal index of the left diseased kidney was $\frac{960}{675} = 1{\cdot}4$.

This is far below the normal, and it indicates that the left kidney is very inefficient. Operation showed that the left kidney was a bag of pus; the patient did not survive, but died in twenty-four hours.

It will be seen from Table 6 that the renal index is low in anæmia and pernicious anæmia, in kidney disease and in diabetes, *i.e.* in these diseases the blood is a good conductor and the urine a bad conductor; the blood may even, as in Cases 1 and 2, be a better conductor than the urine. By means of a blood count the proportion of the corpuscles can be ascertained and allowed for, and the electrical resistance will then depend solely upon the nature and amount of salts present. A low hæmorenal index will then mean that the blood contains too great a proportion of salts and the urine too small a proportion, namely, it points to renal inefficiency; the kidney, instead of withdrawing salts from the

TABLE 6.

Case.	Disease.	Resistance of Blood.	Resistance of Urine.	No. of Red Cells.	Hæmorenal Salt Index.
1	Pernicious anæmia	300	500	900,000	0·6
2	,, ,,	240	400	1,150,000	0·6
3	Pernicious anæmia, recovering.	525	300	5,000,000	1·7
4	Secondary anæmia	500	330	...	1·5
5	Pernicious anæmia	800	250	2,000,000	3·2
6	Pernicious anæmia, recovering.	800	350	...	2·2
7	Secondary anæmia	650	225	2,500,000	2·9
8	Chronic Bright	750	350	...	2·1
9	,, ,,	800	250	4,200,000	3·2
10	Acute Bright, improving.	1400	330	...	4·2
11	Diabetes insipidus	924	2000	Sp. gr. 1002	0·4
12	Pernicious anæmia	Oct. 18, 750	350	2,225,000	2·1
		Nov. 10, 800	450	2,100,000	1·8
		,, 24, 610	600	1,720,000	1·01
		Dec. 1, 653	650	1,680,000	1
		,, 15, 600 (Arsenic).	350	1,490,000	1·7
13	Chlorosis . .	Oct. 18, 750	400	2,930,000	1·8
		Nov. 10, 600	350	3,090,000	1·7
		,, 24, 568	300	3,050,000	1·87
		Dec. 1, 689	300	...	1·96
		,, 15, 750 (Iron).	270	4,970,000	2·7
14	Chlorosis, recovering	Oct. 18, 700	200	3,600,000	3·5
		Dec. 1, 1041	220	4,960,000	4·7
15	Waxy disease .	Nov. 10, 1066	550	2,070,000	1·9
		,, 24, 663	550	...	1·2
		Dec. 1, 757	600	...	1·26
		,, 15, 637	500	...	1·2
16	Diabetes mellitus	Nov. 24, 1120	730	4,960,000	1·5
		Dec. 1, 1120	875	Sp. gr. 1039	1·2
17	Normal . .	Nov. 10, 1600	175	...	9·1
		,, 24, 850	175	...	4·8
		Dec. 1, 1090	200	...	5
		,, 15, 1125	230	...	4·9
18	Normal . .	Dec. 1, 1120	180	...	6·2
		,, 15, 1125	180	...	6·2
19	Pneumonia after crisis	Jan. 8, 960	420	...	2·3
		,, 9, 960	380	...	2·5

blood and secreting them in the urine, is causing them to be retained in the blood. In view of these facts, the kidney function in and the treatment of pernicious anæmia require reconsideration.

Case 12 was examined five times in eight weeks. It will be noticed that the resistance of the blood diminished and the resistance of the urine increased, so that the renal index fell from 2·1 to 1; the patient's condition also got steadily worse, until placed upon arsenic during December, when an improvement set in, and the index rose from 1 to 1·7.

The case of waxy disease has also got worse, the index has fallen from 1·7 to 1·2, and blood has appeared in the urine. The patient, Case 13, remained *in statu quo*, but is now improving, and the index of Case 14 has risen from 3·5 to 4·7, and the red cells are normal in number.

When the author first began to study the hæmorenal salt index, he concluded too hastily that an index of 2 or 3 whole numbers would be quite indicative of good health; further experience has, however, shown him that a healthy index is more frequently larger; it may be 3, 4, 5, or even, as in Case 17, a healthy young physician, 9; this, however, is quite exceptional. The author now looks upon any index below 3 as abnormal and suspicious, and an index below 2 as serious. Surgical interference in kidney lesions is contra-indicated if the index is much below 3.

It will probably be found in the future that the method will be of even more value in surgical affections of the kidney, in order to ascertain the renal capacity before deciding whether to undertake an operation. The author has not had sufficient opportunities of comparing the method with cryoscopy to permit him to draw any conclusions as to their relative value; in the case of Mr. Cathcart the indications of both methods were in agreement, but he would point out at any rate that this is a much more rapid method of clinical diagnosis than cryoscopy, and that only one drop of blood, namely, 5 c.mm., is required instead of the 10 to 20 c.c. for cryoscopy. The determination of the hæmorenal salt index is another example of the application of precise scientific measurement to clinical medicine and surgery, which the author begs to submit to his colleagues.

ON INSANITY, WITH SPECIAL REFERENCE TO HEREDITY AND PROGNOSIS.[1]

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SOMATIC CORRELATIONS AND RESUMÉ.

(*Continued from page* 218.)

HAVING reviewed the clinical experience of twenty-five years from a statistical point of view, I shall now proceed to consider certain correlations between somatic and mental phenomena.

There is no doubt just at present some disparagement of psychology in these studies, and a sceptical attitude towards the assumed occurrence of a mental disorder without an operative physical cause, yet I cannot range myself with the opponents of psychology. For instance, by his researches into the phenomena of fatigue, Kraepelin has explained what was formerly obscure, and improved the methods of education throughout Germany. Mental fatigue and bodily fatigue exercise the same effects upon the brain, and it is a mistake to suppose that by altering the kind of fatigue reparative processes will be encouraged thereby. Italian observers have demonstrated the toxic nature of fatigue in the lower animals, and we can precisely understand the process.

I have reported from time to time cases of communicated insanity—*folie à deux*, and have inquired into cases reported in the newspapers as they occurred. The circumstances are somewhat difficult to unravel, because of the prepossessions of those who relate them, and it would appear that these incidents are more common in France and Ireland than with us. Is it possible to *infect*, so to speak, a person with insanity by immaterial communications?

OBS. 2607.—Two sisters arrived at the asylum one afternoon, the younger being in possession of the usual legal papers for the detention of the elder. They both presented the same pronounced delusions of persecution, both had experienced the same mysterious influences, and both had seen the same visions. They declared that commands were issued to them simultaneously, and they had to obey simultaneously. It became evident that this account of their troubles would not stand rigid scrutiny. The elder sister, who had been successful in business, dominated the younger, and was the active partner, the suggestor of every morbid idea. She had performed the part of a Joanna Southcote, and her sister, her only disciple, explained the failure of intention as the direct result of Satanic interference. It also became evident that the elder sister's insanity had been of considerable duration before the younger sister joined her in lodgings; and, indeed, she remains an ordinary case of chronic delusional insanity. The younger sister, after the separation, improved somewhat at home, but was eventually sent to another asylum, where she partially recovered, and was accordingly discharged. As usual, any hereditary disease was denied, and, as usual, the hereditary defect was ascertained. *I do not believe that any case of this kind could be traced to a family other than neuropathic.* In this particular instance the occurrence of two cases of insanity in the family was only what might have been predicted. It was not by any means simultaneous in inception, or development, or symptomatic phenomena; and I believe that the younger sister would have become insane had the elder remained in her foreign home. She was neuropathic, she lived immersed in morbid influences, and in such a manner as to encourage disaster.

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[1] The Morison Lectures, delivered before the Royal College of Physicians Edinburgh, January 1907.

A successful showman said the other day that the public like to be gulled, and I have no doubt that his appreciation of that psychological fact assured his success. Far-fetched and mysterious explanations of vital phenomena are assuredly popular, and there is a constant ineffective endeavour on the part of insane friends of insane patients to explain away the occurrence of insanity by the principles of Heinroth, by the dispensations of Providence, by the occult influence of hypnotism.

Obs. 2522.—A clerk, æt. 27, had been leading an eccentric, irregular life, and was admitted with the information that he had been insane for a month in consequence of his having been hypnotised by a friend. It was evident that his malady had been of much longer duration, and of insidious development. He laboured under fixed delusions of persecution, was most indolent and untidy. He had no initiative or consideration for others, and his future was of no interest to him. He was removed in that condition, and so remains. The family are neuropathic, and it could not be impressed upon them that the hypnotic experiment was a mere incident in a degenerative disease.

These cases need not be multiplied; indeed, it is with some diffidence that I have referred to them at all. Vulgar errors are of an incorrigible nature, however, and they are so constantly intruded on medical attention that they insist on some recognition. Esoteric Buddhists, or Christian Scientists, or some such perverts, are always with us—not always under care.

The age and health of the parents at the time of conception of offspring are of importance in the evolution of the race. I have recorded several instances of paternal drunkenness in this connection, but the mere accident of one act of drunkenness is relatively unimportant compared with the habitual condition of the persons noted. Nor have I been able to discover any definite relation between the use of forceps at birth and the patients who have come under my care.

What is of real importance in the study of neuropathic children is the immediate ancestry, the environment and the education, which condition them. Dr. Clouston has so lately studied the psychoses of development that I need not enter into this important branch of our subject. Dr. Dewey of Chicago has also investigated the early life conditions in 200 sane and 200 insane persons. This comparative method elicits a series of facts which tend to confirm the observations which I have submitted. Briefly, whatever tended to eugenics found expression in the sane in a higher degree than in the insane. For instance, excessive use of alcohol, of tobacco, of tea, of coffee, appears more frequently in the insane families; tuberculosis, insanity, malarial environment, follow the same rule. Neglect and poverty, lack of home discipline, defective schooling, were all more apparent among the insane. In short, a neuropathic heredity was continued in a neuropathic environment, and issued in a neuropathic generation.

The evolution of character, ability, temperament, and success has not been studied with that care which the subject demands. It is not sufficient to write around the great names. We know that the race tends to average abilities, with some slight advantage to the families of exceptionally able, *well-balanced,* intellectual parents. It is the kind of mistake to which I have already referred that exclusively considers the exceptional, the bizarre, and the extremes. For the determination of the probabilities of inheritance of any character, physical or mental, within normal limits, or the possibilities of disease, a study of the general population is absolutely necessary. The successes *and* the failures must be considered in detail. Professor Karl Pearson has found that the intensity of correlation between "want of mental balance" in parents and insanity in children is from 0·25 to 0·30, probably the same as exists in regard to other characters—*e.g.*, stature, colour of eyes, and so on—thus showing, as might be expected, that somatic conditions are paramount in the first instance; however, environment may possibly influence the organism in its growth and development. I plead that Professor Karl Pearson will have the support of the College in his endeavour to collect sufficient data for the further elucidation of this question, in the firm belief that the results will lead to a better understanding of the national requirements towards the attainment of health and efficiency.

A study of the influence of marriage, widowhood, and divorce as affecting the development of insanity is so complicated by individual circumstances, that any generalisation is almost impossible. I have had little experience relative to divorced persons, and the social conditions of widowhood vary so greatly that there is no possibility of generalising upon them. Unsuitable and unhappy marriages are unfortunately only too common, and I have so seldom known a proposed marriage broken off on the grounds of insanity that there seems to be no immediate hope of relief in that direction. On the contrary, one neuropath seems to have an elective affinity for another neuropath. Probably in matrimony the average practical man looks for the average practical woman; for the fainting fits and genteel spasms of eighteenth century young ladyhood are now quite out of fashion, and athletics reign supreme.

No doubt the daily round, the common task, are irksome to the nervous and decadent.

OBS. V-86.—A married woman with an adolescent family was admitted in a taciturn, apathetic condition. Her home life had for long been burdensome, although the causes were not obvious to others. From time to time she breaks out in violent paroxysms of rage, and expresses the most unjustifiable suspicions of her husband and other members of the family. From time to time she disappears, and once got so far as to engage herself as a domestic servant. She suffers from planomania—an inveterate recurrent impulse to wander. This has been studied under the descriptive title of *vagabondage*, and no doubt constitutes the foundation of the myth of the Wandering Jew. The disorder is common enough, whether one regards it as an ancestral regression or a defect of yesterday. All the cases known to me have been deeply neuropathic; and I can only regard the fact of marriage in this instance as purely accidental, and irrelevant to the real issues.

I have already referred to meteorological considerations, and my difficulty in placing before you any coherent account of my observations. I might add here that we had a good opportunity of studying the influence of the moon, which, when full, formerly so excited the Tom-all-alones of a former age, and which, in nomenclature, will remain with us while Acts of Parliament and official documents so carefully conserve the tradition. In my seafaring days sailors were full of superstitions more or less unaccountable. One particularly in evidence was the baleful influence of the moon—the superlative danger of sleeping on deck in moonshine unless under the shadow of the sails. I suppose that those old tales are already forgotten, like the sailors' chanties, for nothing suits the mariner now but the latest ditty of the music-hall.

Certainly noise and excitement were at their maximum in Murray's Asylum on bright moonlight nights for many years. That was matter of common knowledge, which we reduced to written records. The rooms for disturbed patients were lighted from the south-east and shutters had not been fitted to the windows. When that omission was remedied the change was at once apparent, and the influence of the moon was finally abolished.

As sleeplessness is the most invariable prodromal symptom of insanity, so it is of the greatest importance in the course of the malady, whether from the view of treatment or prognosis.

The high pressure of the blood interfering with repose and nutrition is the chief disturbing factor. The whole endeavour of treatment must be bent towards the restoration of sleep, not so much by the crude effects of narcotics as by the wider application of medical skill. It is not my purpose to touch upon treatment or nursing, nor is it necessary to insist on the importance of this point. The management of the insane at night is quite as important as their management by day, and their conduct at night is just as indicative of their future as their conduct by day. The return of sleep is a sign of recovery or failure to recover—a good sign if improvement is concurrent in other directions, a bad sign relatively if there is no, or but partial concurrence. For insomnia is not a symptom of chronic insanity. Dr. Whitcombe forcibly directed my attention to this fact many years ago. An alarm of fire occurred in a large dormitory at night time in the Birmingham Asylum. The fire brigade entered and retired, but not a single patient moved from her bed; most slept through the incident. Excepting a few cases of chronic mania, a few of circular insanity in the excited phase, and especially of that class in which hallucinations are prominent, or the cœnæsthesia is greatly perverted, the old standing cases sleep soundly and are aroused with difficulty. This restoration of sleep bears a close resemblance to the increase of body weight; if the nutritive processes become active and there is a concurrence of other favourable signs, the outlook is hopeful; but degeneration may go hand in hand with an unhealthy pallor, and an undesirable, flabby corpulency accompanying permanent enfeeblement of mind.

It is this morbid somnolence which permits of the frequent and necessary attention of nurses to the chronic insane. One must clearly discern the values of all the symptoms existing before coming to a conclusion that the cessation of insomnia is of good omen.

When the nightly duration of sleep is charted, it is usual to find a cyclic variation, in conformity with observations in other directions. The sleep may be sufficient on alternate nights, or the cycle may extend to seven or more nights. Usually it is variable and dependent upon the somatic changes.

When the somatic failure is general, it is evident to the most casual observer. The chronic degraded patients of one asylum closely resemble those of their class in any other asylum. The physiognomy of insane persons used to find occasion for remark in the formal legal certificates almost as a matter of course, and perhaps it is a sign of more accurate scientific knowledge that these observations are less frequent in the practice of to-day. I do not know that it is a gain. Dr. Lionel Weatherley told me that when he went home from college to his father's practice he had occasion to see a patient suffering from pneumonia. He returned with his diagnosis, and, to the best of his ability, described the symptoms as revealed by the stethoscope. His prelection was very ill-received, and he had to go back in order to bring his father a full, true, particular account of the patient entirely apart from the precise stethoscopic condition of the lungs.

We cannot neglect the facial appearance of the patient in discussing the question of prognosis. It is characteristic of degradation, if degradation has declared itself. Apart from the emotional expression of the prevailing mental tone, there is an immobile, listless, preoccupied appearance which augurs badly for the future. The nervous system is out of gear, and the enfeebled muscles indicate that failure. The complexion is pallid, and the skin shares in the general inefficiency. The eyes are relaxed and their mobility is restricted. Pigmentation of the skin is of evil omen, and if it is systematically picked by the patient one can hardly look for recovery. I could cite one or two cases to the opposite effect, but they are very rare and present other counterbalancing symptoms.

The morbid condition of the skin in insanity has not been sufficiently investigated as yet. The development of nervous system and skin from the point of view of embryology may in some measure elucidate these complications. In any case, the extremes of harsh dryness in certain forms of melancholia and copious perspirations in certain forms of mania are commonly recognised. Also the greasy, offensive appearance in degraded cases. Perhaps the most important cutaneous symptom from the point of view of prognosis is the pigmentation which so frequently occurs, and which must be considered as indicative of a progressive and intractable disorder when it is unmistakable and long continued.

The appendages of the skin are also affected. The state of the hair is a valuable index to the general condition. This was most marked in a case of alternating insanity, in which the strong black hair stood absolutely on end during the excited period. Sir Arthur Mitchell expressed a doubt if this were possible without the manual interference of the patient, who was therefore closely and continuously watched for a considerable period. It proved to be a true somatic condition. The patient so affected long suffered from phthisis, and as her bodily strength diminished the stark condition of her hair became much less marked. There are other records of affections of the nails, and notes of desquamation which I need not discuss at length.

A persistent high temperature is a warning of evil import, as regards recovery, and even as regards life. The high temperatures of insanity, apart from complications, are, of course, usually very moderate compared with other diseases. I have already alluded to this in speaking of observations made possible by the clinical thermometer.

The general nutrition, perhaps, is the most certain index of the progress of a case, as has been well brought out by the study of body weight in recoveries and removals. In asylum life the periodical and exact weighing of patients is a routine practice generally adopted, and generally trusted to indicate the variations in somatic conditions which are so important in the adoption of remedial measures suitable for each particular case; also as indicative of the earliest warnings of complications such as tuberculosis. A restoration of lost body weight, like a restoration of diminished secretions, is almost invariably one of the first signs of returning health.

The muscular system presents very many problems of interest, apart from the pareses and paralyses of pathological insanity. The fumbling fingers of a general paralytic fail in muscular energy, in co-ordination, and in the guiding direction of the higher cortical centres. In lesser degree the finer adjustments of intention and action are discernible in ordinary insanity, and as the degradation deepens so the inability becomes declared. The somatic failure is then positive. Instruments of precision are applied with difficulty in the elucidation of these conditions. The common failure in attention renders it impossible to record reaction time, or the appreciation of weight, without making large allowance for error. Again, the motor reflexes, even in cases of advanced dementia, are sometimes, and exceptionally, very brisk. But as a general rule it may be stated that the deeper the mental degradation the more obvious are the reflex defects, whether motor or mental. All cases displaying rhythmic, monotonous movements are to be regarded as most seriously damaged. In some cases these movements, apart from idiocy, have a gross pathological basis. I recall an extreme case of cerebral atrophy, especially of the frontal lobes.

The morbid condition of bones in the insane has long been recognised, and I believe that the anæmic failure of the chronic insane is part and parcel of the osseous defect. I shall not venture to discuss questions of craniology, in reference to which palatal deformities are of importance in determining a neuropathic heredity in many cases where information is given reluctantly. A few words may be permitted in reference to oral sepsis and a common symptom of general paralysis — a persistent grinding of the teeth.

Dr. Rayner's work in the Out-patient Department of St. Thomas's Hospital has been amongst the insane, and especially amongst incipient cases; and his conclusion is that one of his most important duties has been to hand over these persons to the care of the dental surgeon. The improvement in mental condition after his attentions are completed has been so remarkable, that Van der Kolk might have added another sympathetic insanity to his list. I need not load this aspect of the subject with clinical details. The importance of oral sepsis as a cause of widespread mischief is now generally accepted. I have noticed, too, that recurrent insanity, or exacerbations of insanity, are often ushered in by attacks of toothache or facial neuralgia, and think it of sufficient interest to mention this fact, which may be regarded as a danger signal.

The gait of insane patients is characteristic: the bent, stiff neck, the downcast eyes, the untidy dress, the careless slouching walk, are all in various degrees indicative of somatic and mental degradation. Extraordinary attitudes impress one unfavourably. Often these are assumed by adolescents who may recover, but my experience is that they are symptomatic of relapse sooner or later.

Alterations in handwriting, and tricks of voice or speech, indicate the interaction of mind and body in many important directions. Vain and purposeless repetitions of phrases in the letters of a person not appreciably insane are often evidence of chronic alcoholism, and specially, I believe, of cocainism. In the case of a person tending towards chronic insanity, such repetitions are a mark of incurability. The corresponding phrase of speech is not less ominous; still, there is a lower grade—*echolalia*; in which there is a repetition of words heard by the patient and immediately reproduced; and lower still in the scale is *verbigeration*, in which new words are invented.

This perversion of intellect is, of course, quite different from the confusion of mania where rhymes are commonly strung together in an incoherent succession, yet connected by some associations of sound or sense. It is, so far as I am aware, the outcome of a brain incurably perverted, and calls to mind the thesis of that interesting old book—"Wigan on the Duality of Mind."

Long periods of absolute taciturnity may result in recovery, confusion may very readily disappear, but the occurrence of verbigeration is a symptom of degeneration not less ominous than persistent amnesia.

Stuporose states often mark the swing of the pendulum from high excitement to temporary exhaustion, and it is often very difficult to distinguish between curable and terminal dementia.

Obs. 2188.—Lady, æt. 25, admitted in a condition of acute mania. Family neuropathic. A discharge from right middle-ear disease had ceased on the inception of the mental disorder. Erythromelalgia had been observed, and the usual somatic concomitants were recorded. The malady was prolonged and threatening to end in chronic insanity. A stuporose condition varied with subacute transient excitement—a complex which I regard as ominous. Under a course of thyroid treatment she made a good recovery, and throughout the years which have passed it continues necessary for her welfare to take one or two thyroid tablets weekly. A prominent feature in this case was the occurrence of drenching perspirations, which Millingen long ago regarded as indicative of failure. I must refer to Dr. L. C. Bruce's clinical studies for the modern explanation of this complication, and its place in the evidence for toxic invasion.

To resume, then, these various conditions of the organism betray, each in its own relations, the generalised nature of insanity, the generalised defect and disorder in which the mental symptoms originate, and upon which they depend. Within the compass of these brief lectures it is impossible to discuss all the somatic conditions. I rather endeavour to indicate the trend of experience, and prefer to reserve the consideration of highly specialised subjects of importance, such as the work of Flechsig relative to the association fibres of the brain demands.

It is generally recognised that prognosis will vary with the incidence of somatic disorders and diseases. If bodily health can be re-established, there is hope of mental improvement and recovery. For instance, if there is no possibility of restoring a damaged cardio-vascular system, the outlook is gloomy. Prognosis, therefore, must await the determination of these events. However, a case may be desperate yet recoverable.

It is necessary to read for hæmopoietic disorders, *anæmia.* The important variations of the blood discoverable by modern methods can, of course, find no place in old records. In the cardio-vascular group it is important to note the depression and fears which are exaggerations of the usual features of these maladies. Gastro-intestinal cases are similarly affected. The great excess of the female sex under the heading of generative disorders is in accordance with general experience. I have not been able to corroborate certain American observations, which record extraordinary voluminous morbid details in the sphere of gynæcology. There can be no doubt that the urine and vaginal discharges of the insane are highly toxic, but the vast array of surgical necessities alluded to is not within my experience, either by the bedside or in the post-mortem room.

The common concomitant of generative disorder is the irregularity or suppression of the catamenia. It is usually said that menstrual periods are accompanied by exacerbations of insanity. That is by no means the rule according to my observations. No doubt the return of catamenia is a favourable indication, and we have had several such cases after the exhibition of ergoapiol where other drugs had failed. I might also record a case of recovery in which the catamenia continued suppressed, and were restored by the introduction of a stem pessary at home. Quite exceptionally I have had good results from the use of ovarian extract after ovariotomy, but can present no case under asylum treatment in which that preparation altered the mental condition.

It is our routine practice to record daily on calendars the excitement or depression noticeable in individual patients. These calendars also show the days of menstruation. I have condensed these observations for years together, and on examination of the results find that it is quite exceptional to correlate the catamenia with the exacerbations of insanity; occasionally this is discovered in mania, but never in melancholia, so far as my observations go.

What is of much more importance are the toxic conditions of these tracts, whether puerperal or not.

Obs. 2697.—Male, æt. 57. Family neuropathic. Admitted in a state of alcoholic dementia, with delusions of identity and hallucinations of hearing. He had lost all sense of time and space. Apparent total amnesia. Urine purulent and highly ammoniacal. His physical condition was greatly deteriorated. Under a course of helmitol the urine cleared and his mental state improved. He made an excellent recovery and returned home. I am informed that he has not resumed his habit of alcoholism; but the pathological state of the urine became again evident. He was naturally anxious as to this disconcerting experience, and helmitol was again administered; the urine cleared up, and he continues in better health than he has known for years.

Dr. MacHardy[1] has recorded two cases of general paralysis improved, if not recovered, by the use of urotropine; unfortunately we have had no such result in these extreme circumstances.

One point in regard to these generative disorders and their correlation with the sense of smell is remarkable. It is generally stated that the connection is obvious and common. I have not found it so; in spite of a special examination of all the cases, I have not discovered any record in corroboration of that statement, and can only conclude that it is not so obvious as has been asseverated, or that we have overlooked a series of facts.

Another general statement relates to the probability of recovery after the patient has had a crop of boils. That is quite opposed to my experience. The microbic infection of boils does not seem to me to have acted as an *alterative*, far less has it exercised a beneficial effect physically or mentally. The question of alteratives is of special importance in medicine general and therapeutical. It offers an interesting opportunity of discussing unconscious memory in relation to insanity, in the light of the suggestive and philosophical work of Dr. Charles Creichton. I leave it with reluctance, and do not purpose entering on any psychological analysis of the cases reviewed. My aim has rather been to direct attention to somatic disorders and to correlate these with insanity under the two broad divisions—ordinary and pathological. Yet it is necessary to say something in general terms. For instance, the primary fact of consciousness has a relation to prognosis; if it is lost for any considerable space of time, it is a measure of mental degradation indicating incorrigible defect. Mere confusion is not at all a hopeless condition, but delirium is of the gravest import. I have not found that perversions of identity are so incurable as was formerly supposed; but as a general rule it may be stated that perversions relative to self are much less intractable than those relative to others. Did time permit, these opinions could be supported by clinical illustrations; but I must pass to the sphere of sensation. The general cœnæsthenia is of importance in this connection. It is a common measure of convalescence to observe carefully the mental attitude relative to fatigue. A loss of the sense of fatigue, an abolition of sensation in regard to fatigue, denotes an uninterrupted course of mental disorder; on the contrary, when the patient begins to complain of fatigue and pain and discomfort, the complaint is welcomed as the first sign of improvement.

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[1] *Brit. Med. Journ.*, London, 1905.

The genesis of delusions from the painful sensations of gastro-intestinal disease is readily understood: it is easy to pass from the feelings of gastritis to the feelings of poisoning. In fact, I would venture on the generalisation that perverted sensations determine the tone of the delusions, and the general mental condition. It is unthinkable that the depressing nature of abdominal disease, altogether apart from insanity, should issue in grandiose ideas or pleasurable excitement.

The emotional states, of course, vary in every conceivable direction; perversion and degradation are only too often recorded. It is always a favourable sign when a patient returns to natural ties, when natural affections resume their sway.

The measure of degradation may be ascertained by observation of the power of attention and memory; yet these may be acute and the condition of the patient may be hopeless as regards recovery. It is commonly supposed that an unimpaired memory is an indication of sanity, yet the idiot savant may have a memory of extraordinary tenacity. The perversion of intellect may be complete, and both attention and memory perfectly unimpaired. I have, at present, two patients who are old-standing cases of delusional insanity — persecuted persecutors. They generally live in one of our detached houses. During the temporary absence of one, the other gravely asked me if I would hasten his return, for her enemies were very hard upon her, and if he came back it would distract their unwelcome attentions from her. If the degradation is not wide, it may still cut very deep.

In point of time we have already seen that recent cases are most favourable in expectation of recovery, and that cyclic variations are common. Also that a sudden onset and a sudden recovery almost inevitably mean neuropathic inheritance, and recurrence sooner or later. A settled periodicity is bad, yet if there are no remissions tending to recovery, the outlook is not less gloomy. The best sign in this respect is intervals of remission, daily becoming of longer duration, and it is specially gratifying when self-knowledge returns, interest in surroundings is displayed, neatness of dress is studied—in fact, when there is an indication of an appreciation of the amenities of existence, when the prayer of the Kilbarchan weaver is answered—in moderation.

And so we inevitably come back to the initial stage of this discussion—the importance of somatic conditions in relation to the mental states. Prognosis in insanity must proceed upon a wide and careful review of the whole circumstances affecting the individual, who is in a degenerative condition physically, and therefore mentally. All that goes to make up that degenerative condition must be separately investigated and summed up. The elements of prognosis are analytical *and* synthetical, and it is determined by the nature of the degree of the involvement of the organism in the widest sense. If all the functions are involved, if the degenerative process is universal and intractable, the future of the individual is desperate indeed; if the defect is partial and amenable to treatment, naturally the case is more hopeful as these limitations of involvement decrease.

In that sense how hopeless is the case of pernicious anæmia, in which the mental manifestations are the direct result of an impoverished brain! For a time it may be possible to draw upon the reserve of red blood corpuscles, but the stock is not inexhaustible.

It is in consonance with these observations that the toxic theory of insanity demands our most serious attention and excites our liveliest hopes.

Prognosis can never be an affair of aphorisms; these *obiter dicta* require to be fitted into the general scheme of things; they are altogether too facile and too partial for our purposes.

I shall not stand suspect of neglecting the therapeutical and general treatment of insanity in having discoursed at length upon data and deductions. The therapeutical position is being slowly won by the steady advance of our science and art.

We have, perhaps, carried architectural planning, training of nurses, farming and gardening, as far as it is desirable, for there is a general consensus of opinion that this country holds an honourable place among the nations in these matters. When Mr. Holloway was moved to erect a hospital for the insane of the poorer middle-class, in the course of his inquiries he asked Dr. Yellowlees if asylum entertainments were undertaken in the interests of the patients, or merely in order to find notice in the local newspapers. That was a shrewd question by an expert in the gentle art of advertising. It was answered to his satisfaction by a practical demonstration, followed by no public references.

I hold it desirable that a physician should know the baths and wells of Europe, and that he similarly should know the hospitals of the country, before he distributes his patients amongst them. There has been some foolish talk about the *Hanwell Wall*, and the segregation of the insane—as if the insane became insane in asylums. I know no hospital for the insane where our colleagues are unwelcome in their most intimate medical concerns; and the burden of these lectures is the burden that is laid upon our honourable profession, not to be borne by asylum physicians alone, but shared by every worker, in every contributory detail. The problem does not, unfortunately, concern the mass of chronic and incurable insanity, it is relative to the inception of insanity—the early treatment of insanity as it is presented to the family doctor and none other. These metropolitan provincialisms want clarifying.

For any one desirous of following out the individualised, mental and moral treatment of the insane, I know of no book so interesting as that of the late Dr. John S. Butler, of the Connecticut Retreat. It is a little book, a very little book, on a great subject, and it will keep his memory fragrant and green as a wise physician. It is rosemary for remembrance. And yet, Dr. Butler, occupied with this aspect of his work, insists again and again on the importance of the early somatic conditions of insanity, and the necessity of early and appropriate medical treatment.

Finally, on the general question of prognosis of insanity we have been counselled to give a guarded opinion, because it is the unexpected that happens. An eminent physician once said that he was paid for an opinion, not for a prophecy. But an opinion is truncated and ineffective if it be only relative to the moment of delivery. The questions demanded of us are urgent and necessary: Is the family business to be wound up? Are the pressing difficulties permanent or temporary? Is the home life to be altered for a time or for ever? Are careful plans for a career to be abandoned or postponed? I am impatient with a science that executes a strategic retreat before such a battery of questions. In the last resort the kindly words of Horace recur to us:

> "Tu ne quaesieris, scire nefas, quem mihi, quem tibi
> Finem di dederint, Leuconoe, nec Babylonios
> Tentaris numeros."

Yet it is a poor account of scientific medicine if it is to be recorded of us that our premonitions are of no more value than a Chaldean horoscope.

It is an excellent practice, in which throughout the years I have followed Sir James Crichton-Browne, to sum up the probabilities in the case-book on the reception of every patient. At least, it is a stimulating corrective for self-satisfied science; at best, an incentive to the careful study of every circumstance affecting each patient. For it is only by that study, indefatigable and personal, that advance is possible to us or to our profession.

More steadfastly than ever our profession labours for the prevention of disease. That resolves in questions of eugenics, education in the widest sense, and a determined, informed study of all morbid phenomena.

TWO FORGOTTEN MEDICAL WORTHIES.

By Andrew Cassels Brown, M.D., *Rock Ferry.*

There are not, I take it, many medical men familiar with Sir William Banks' charming address, to which he gave the title of "Physic and Letters," who are likely to forget the delightful closing passage, in which he describes a visit to one of his oldest and kindest medical friends, who had retired, some few years before, with a modest but sufficient competence. "After a while," says Sir William, "I went with him to have a chat and a cigar in his study. I knew him always as a reader, and so I was not surprised to find "Joseph Andrews" lying on the table, nor to hear him say that he was just going through Fielding again, and that the oftener he read him the more he enjoyed him. We talked about friends and old times and practice, and many things beside, but we got back eventually to reading, and his last words were—'Not for a thousand a year would I lose my love of reading.'"

In the moil and toil of a modern medical practice this love of reading is, of a surety, one of the best methods by which the jaded doctor—harassed, it may be, by a difficult case, saddened by a sordid tale of poverty or wretchedness and worse, that ever, like an evil dream, attends upon his thoughts, or puzzled by the ingratitude or wilful misunderstanding of a patient—may, as by magic, cast care and trouble to the winds, and, forgetting all in the study of his favourite author, take heart and courage once again for the work that lies before him. There is not a man but will bear me out when I say that many such a happy result has been obtained by a couple of hours at the fireside in the company of Fielding or Thackeray or Scott, of Stevenson or Kipling or Flora Annie Steel. But great and of deservedly high rank in fiction as have been the men and women, whom the genius of their creators has enabled us to know and love and hate, to me they cannot compare in absorbing interest with those whose fate it has been to play a part, be it ever so humble, in the actual making of history. Biography, therefore, has for long held pride of place in my affections, and I have ranged at will, but always with the utmost pleasure and profit, from

Boswell's immortal "Life of Samuel Johnson" to Thornton's able account of Sir Robert Sandeman, the intrepid Scotsman by whose unaided efforts the whole of Beluchistan was annexed to our Indian Empire. And it is amazing to realise the number of first-class men whose lives have been devoted to the service of that fascinating Eastern peninsula. It was, indeed, while reading the life of one of the greatest—perhaps the very greatest—of them, that I came across the sentence which has led to the writing of this paper. For it is one of the advantages of a course of biographical reading, that the casual mention of an interesting name irresistibly impels the reader on a tour of discovery, which never slackens until, if I may use a sporting term, he has run his quarry to earth. So an appreciative allusion in Malleson's "Life of Warren Hastings" to the disinterested patriotism of two old East Indian surgeons, named respectively Gabriel Boughton and William Hamilton, induced me to investigate such details of their lives as have been handed down to the present day. That the result of my investigations has not been wholly without success, I hope to demonstrate satisfactorily in the following pages.

In order to thoroughly understand their careers, it will be necessary to devote a few lines to an account of the condition of India prior to the first settlement of the English, and also to the early history of the English themselves. From 1556 to 1605, under the tolerant rule of the most celebrated of the Great Moghuls, the Emperor Akbar, the natives of Hindustan, the Punjab, and Cabul enjoyed a comparatively peaceful time. Not that the Moghul dominion under Akbar and his two immediate successors, the Emperors Jehangir and Shah Jehan, — the sovereign, by the way, who caused his name and titles to be engraved upon the Koh-i-Noor,—was ever anything else than an absolute and irresponsible despotism. But each Padishah that I have mentioned was intelligent enough to confer upon his subjects the priceless boon of liberty of conscience, and the Empire only began to disintegrate when Aurungzebe, who reigned from 1658 to 1707, reversed the wise policy of his ancestors, and, by persecuting his Hindu subjects with a bigotry which was all the more intolerant in that he himself was never a sincere believer in Mohammed, thus paved the way for the future conquests of the Honourable East India Company. It was during the reign of Jehangir that the English first obtained a footing in India. They were enabled, in spite of the determined opposition of the Portuguese—to whom the Pope had given the sovereignty of the East a hundred years before—to establish a factory at Surat, a town some two hundred miles north of Bombay, in the year 1613. From this place they were enabled to trade with a profit which can only be described as prodigious. In 1639 a strip of land, six miles long and one mile broad, was purchased, on the eastern coast, by a certain Mr. Day from the Rajah of Chandragheri. This was the first Indian territory actually owned by the English, and on a small island opposite the strip of land was built the town of Madras. In 1661 Bombay was handed over to the English as part of the dowry of the Portuguese Princess who married Charles II. In 1674 the island was visited by a certain Dr. John Fryer, a Cambridge physician of some repute, and a Fellow of the Royal Society, who left a record of his experiences, which is, of necessity, of much interest to medical men. Though not strictly appertaining to my subject, I beg leave to give one or two extracts from his book. "But for all this gallantry," he says, alluding to the residents at Bombay, "I reckon they walk but in charnel-houses, the climate being extremely unhealthy. I impute it to the situation, which causes an infecundity in the earth, and a putridness in the air, what being produced seldom coming to maturity, whereby what is eaten is undigested; whence follows fluxes, dropsy, scurvy, barbiers (which is an enervating the whole body, being neither able to use hands or feet), gout, stone, malignant and putrid fevers, which are endemical diseases." "In five hundred, one hundred survive not: of that one hundred, one quarter get not estates; of those that do, it has not been recorded above one in ten years has seen his country." Though the English gained possession thus easily of both Madras and Bombay, they experienced a far greater difficulty in forcing an entry into the rich province of Bengal. In 1631 the Emperor Shah Jehan ordered his General, Kasim Khan, to expel the Portuguese from Hugli, which they had occupied since 1537. This was done after a siege of three months, and with a loss to the Portuguese of more than 2000 men. Seven years later, he appointed his second son, Shah Shuja, to be Viceroy of Bengal. This prince, whose marriage festivities cost his father the stupendous sum of 88 lacs of rupees, changed the capital of the province from Gaur to Rajmahal in 1639.

It is now that Gabriel Boughton comes upon the scene. The only mention of him that I have been able to trace previous to this date, is an allusion to him in the narrative of Sir Thomas Roe, who, in 1615, had been sent by James I. as ambassador to the Emperor Jehangir, and who remained at the Great Moghul's court for three years. For many years after this we hear no more of him, but in 1636–37 we find him at Surat in medical charge of the Company's ship "Hopewell." It is not, perhaps, an unreasonable conjecture to say that, in all probability, he had acted, during the interval, as one of the Company's ship surgeons, but had had no particular opportunity of distinguishing himself. From this date onwards, however, his deeds become a matter of history, and I propose to give an extract from Stewart's "History of Bengal" concerning the generosity of his behaviour towards "the United Company of Merchants trading to the East Indies," which will go far to justify one-half, at least, of the statement of a correspondent of mine when he says, "It is plain that Boughton and Hamilton were two of the most valuable predecessors of Clive and Hastings."

"In the year of the Hegira 1046 (A.D. 1636–37) a daughter of the Emperor Shah Jehan, having been dreadfully burnt by her clothes catching fire, an express was sent to Surat, through the recommendation of the Vizier Assad Khan, to desire the assistance of a European surgeon." (Assad Khan was probably identical with the minister Asaph Chan, who is often mentioned by Sir Thomas Roe, and who no doubt became acquainted with Boughton in his capacity of surgeon to the Embassy.) "For this service the Council at Surat nominated Mr. Gabriel Boughton, surgeon of the ship 'Hopewell,' who immediately proceeded to the Emperor's camp, then in the Deccan, and had the good fortune to cure the young Princess of the effects of her accident. Mr. Boughton, in consequence, became a great favourite at Court, and having been desired to name his reward, he, with that liberality which characterises Britons, sought not for any private emolument, but solicited that his nation might have liberty to trade free of all duties to Bengal, and to establish factories in that country." (Malleson gives the weight of his support to this by the statement that Boughton, who knew at the time of his mission that his countrymen were actually debating whether they should not abandon the small port of Pipli,—the only one they had the Imperial authority to use for trading purposes in Bengal,—recognised that an opportunity had come to him such as might never recur to place the trading affairs of the Company on a substantial and permanent basis.) To return to Stewart: "His request was complied with, and he was furnished with the means of travelling across the country to Bengal. Upon his arrival in that province he proceeded to Pipley, and in A.D. 1638–39 an English ship happening to arrive in that port, he, in virtue of the Emperor's firman and the priviledges granted to him, negociated the whole of the concerns of that vessel without the payment of any duties. In the following year, the Prince Shuja having taken possession of the government, Mr. Boughton proceeded to Rajmahal to pay his respects to His Royal Highness; he was most graciously received, and one of the ladies of the Haram being then indisposed with a complaint in her side, the English surgeon was again employed, and had the good fortune to accelerate her recovery. Owing to this event, Mr. Boughton was held in high estimation at the Court of Rajmahal, and by his influence with the Prince was enabled to carry into effect the order of the Emperor, which might otherwise have been cavilled at, or by some underhand method rendered nugatory." (In a rare book, called "The English in Western India," by Philip Anderson, in the possession of my relative, Mr. J. A. Cassels, Stewart's account is corroborated in almost every detail. Anderson, however, states that the patent for trading duty free throughout the Moghul's dominions was given by Shah Jehan to Boughton for his own use. The "generous surgeon," by which name he was always known, did not forget his employers, but advanced the Company's interests by contriving that his privileges should be extended to them.) To conclude from Stewart: "In the year 1640–41 the same ship returned from England, and brought out a Mr. Bridgeman and some other persons for the purpose of establishing factories in Bengal. Mr. Boughton, having represented the circumstances to the Prince, was ordered to send for Mr. Bridgeman; that gentleman, in consequence, went to Rajmahal, was introduced to the Prince, and obtained an order to establish, in addition to that at Piply, factories at Ballasore and Hoogley. Some time after this event Mr. Boughton died, but the Prince still continued his liberality to the English." Malleson says up till 1657, when he and all his household were brutally murdered by the King of Arakan, to whose court he had fled for refuge after his unsuccessful attempt to wrest the dominions of his deceased father Shah Jehan from the usurpation of his younger brother Aurungzebe.

In this age of accurate and scientific investigation, it is not to be expected that Stewart's account of Gabriel Boughton has been allowed to go unchallenged, and I find in an appendix to the "Diary of William Hedges" (who was Agent-Governor of Bengal from 1681 to 1683), which was edited for the Hakluyt Society by Col. Sir Henry Yule, the following criticism:—"This extract from Stewart furnishes the earliest version that I have been able to find of this story in its completeness, and it has become the staple of the popular historians, but I cannot trace it to any accessible authority. The extract certainly makes some confusion of authentic dates and circumstances, but apart from that confusion, and though we shall see that Gabriel Boughton was a real person who acquired the favour of Shah Jehan and members of his family, I know not where to find the particulars referring to the fire accident, or to the patriotic direction concerning the Great Moghul's remuneration. Major Stewart was a conscientious and diligent writer, but it was not the fashion of his day to give any amplitude of reference, and his are not clear. It is possible that the native authorities used by him would give the foundation of the story." Colonel Yule produces evidence from the records of the India Office, and in this he is supported by Wheeler and Birdwood, both accurate historians, that a firman granting the Company permission to trade in Bengal without any other restriction than that their ships were to resort only to Pipli, was issued by the Great Moghul, and despatched to Surat bearing the date of 2nd February 1634. He also shows that the Company had factors stationed in Bengal as early as 1633, and quotes a letter written by one John Poule, left in charge at Balasore, to Mr. Cartwright, chief agent in Bengal, which is dated July 1633. In 1640, according to Wheeler, the English obtained further privileges in Bengal, which he attributes to the services rendered by Dr. Boughton, and certainly in that year they established an agency at Bussorah, and factories at Hugli and Carwar. In 1646 the Viceroy of Bengal, our old friend Shan Shuja, made further concessions and placed the factories at Balasore and Hugli on the most favourable footing. The question, therefore, comes to be, What share did Boughton really take in the obtaining of the ever-increasing privileges bestowed upon his masters in Bengal? We will let Colonel Yule answer by further quotations taken from his own book. He first of all says that there is authority for the fire incident given in Dow's "History of Hindustan" (which is he remarks, a loose and glossed translation from Mussalman writers). In it, the statement is made that the cure was effected by one Anit-Alla, the most famous physician of his age, who was summoned express from Lahore. It is particularly to be noted that this extract is under the marginal date 1643. Colonel Yule next quotes a letter which was written by the President and Council at Surat to the London Directors on the 3rd January 1644, from which I extract the following: "Assalaut Chaune,"—not very different this name from "Assad Khan" or "Asaph Chan" in the days when spelling was decidedly phonetic,—"a very great vmbra, gratious with the King and our very good freind (*sic*), haueing long importuned us to supply him with a chirurgeon; wee Consideringe how advantageous itt may be vnto you, and haueing a fitt oportunity, one Gabriel Boughten, late Chirurgeon of the 'Hopewell,' being thereunto very well qualified and being willinge to stay, wee have thought fitting to design him to that purpose," and other words to the effect that all at the Court, which was then at Agra, were so well pleased with him that the King had honoured two of the Company's servants on their return to Surat with presents of jewelled vests and daggers, and the grant of firmans. Malleson, referring to Bruce's "Annals of the East India Company,"—Bruce having had access to all the official papers,—agrees with Colonel Yule as to the date of Boughton's mission to Agra being 1644. There can be no doubt, then, that whether Boughton cured the Princess or not, the two events occurred at practically the same time, and the next extract given by Yule, from the records of the India Office, shows definitely that the surgeon had been transferred to Bengal and was apparently using his influence there to serve his countrymen.

Boughton is subsequently mentioned in a letter of instruction for Mr. Bridgeman, the chief, and the other factors at Balasore and Hukely. "You know how necessary," runs the document, "it will bee for the better carrying on the trade of these parts to have the Prince's ffirman, and that Mr. Gabriel Boughton, Chirurgeon to the Prince, promises concerning the same. To putt matters out of doubt it is necessary that you forthwith . . . proceed to Rajmahal . . . where being come, consult with Mr. Boughton about the busines, who hath the whole contents of the Dutches last ffirman, and together endeavour (if possible) that (according to Mr. Boughton's promise) the Company may have such a ffirman granted, as may outstrip the Dutch in point of Priviledge and freedome, that so they may not have cause any longer to boast of theirs. You know what I have written to Mr. Boughton about it, who (without doubt) will bee very faithfull in the busines, and strive that the same may be procured, with as little charge as may be to the Company . . . according to his owne advice in his last to me." This letter leaves no doubt as to the important position occupied by Boughton at Shah Shuja's Court, and the next extract shows the Masulipatam agency testifying its sense of his favours past and to come by inditing the following letter to Mr. Bridgeman: "Alsoe you may take notice of 3 Guze[1] of Scarlett and 16 yards of Gould and Silver lace in Wm. Beuis his coustody the which demand of him and present as a piscash from us to Mr. Gabriel Boughton, whoe being the Prince's servant, wilbe doubtless a great help unto you to gain his ffirmaund . . ." Colonel Yule points out that the use of the word peshcash is singular in relation to an ex-employee, but it was doubtless offered to Boughton in his capacity of servant to the Prince. The last mention of Boughton in the records, though it has its ludicrous side, has yet seemed to me strangely pathetic. It occurs in 1657, when he has been dead for some time and his widow remarried to a Mr. William Pitts. This man, who had evidently got himself deeply into the hands of the usurers, was petitioning the Company, on the strength of Boughton's benefactions in former times, to pay his debts. Thus we read in a letter from the Court of Directors to Fort St. George: "Our ffactors in the Bay are much troubled by one William Pitts, who married the Relict of Gabr. Boughton, who having taken up monies at Interest of the Moores, they very much press the payment thereof out of our Estate, but wee hope you have so manadged the businesse and given such advice to our ffactors that hath armed them with such arguments as to enable them to withstand and to oppose such unjust and unreasonable demands."

After a careful examination of those authentic documents, we must be forced, I think, to the following conclusions:—

That Boughton was sent from Surat to Agra, and not to the Deccan, neither in 1636 nor in 1639, but probably in 1643, as the letter written to the Directors, under date of 3rd January 1644, which refers to his expedition, distinctly states that his visit had been a most successful venture.

That the accident to the Princess probably occurred in

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[1] A Persian measure.

1643, and that, while there exists no certain evidence regarding Boughton's professional assistance on the occasion, it is quite within the bounds of probability that he was consulted and was enabled to effect a cure. Certainly no one denies that he was high in the favour both of her father and her brother, and this fact in itself of necessity adds weight to the truth of the popular tradition, that it was entirely through Boughton's influence with Shah Shuja that the Company obtained their most valuable trading privileges in the province of Bengal in 1645–46.

We cannot do better than take leave of the "generous surgeon" in the warm-hearted but somewhat grandiose and sentimental words of Messrs. Miles and Dodwell, who wrote an article upon "Surgeons in India" in the *Calcutta Review* some fifty or sixty years ago. "We wish we could add," say they, "that Boughton received the full reward of his generosity, in living to see his masters' power firmly grounded in Bengal, as the foundation of the mightiest colony that the world has ever known, and in dying under his father's roof-tree, with tall sons and fair daughters around his bed. This, however, was not to be: he died in India not long after the opening of the ports. Do the ruins of Rajmahal still enshrine that honourable dust, or have the waves of the invading river swept it down to that ocean which was the only fitting sepulchre for so large and pure a heart?" These gentlemen hazard the conjecture that Boughton was of good lineage, and suggest that the baronetcy conferred by Charles I. upon one of his name in 1641 was in recognition of his merits. I am courteously informed by Sir William Rouse Boughton, the present representative of the family, that the title was conferred for loyalty shown to the King, and that the name of Gabriel Boughton does not appear in any pedigree in his possession.

From 1657 to 1715 the history of the English in Bengal reflects in no uncertain manner the disturbed state of the times. Their peace of mind and success in trade depended very largely upon the caprice of the reigning Nabob, and in the latter year it was determined, on account of the oppressive treatment meted out to them by the then Subahdar of the province, Murshid Kuli Khan, to despatch an Embassy to the Court of the Emperor Farrukh-Siyar, then at Delhi, together with gifts to the value of £30,000 sterling, in order to obtain confirmation of the Company's old firmans and immunities. A certain Mr. John Surman was in charge of the expedition, and he was accompanied by Mr. Edward Stephenson, an able factor in the Company's service, by Khoja Serhaud, the principal native merchant in Calcutta, who acted as interpreter, and by Mr. William Hamilton, who attended in the capacity of surgeon. It will be seen that Hamilton, by an act of patriotism, perfectly similar to that of Boughton, became the second medical man in whose power it lay to materially advance the interests of his nation.

In the *Calcutta Review* for April 1903 the late Dr. C. R. Wilson published an exhaustive and able article on the "Personal History of Dr. William Hamilton, Benefactor of Calcutta," from which I propose to cull a few extracts dealing with his life previous to his appointment as surgeon to the Embassy. Hamilton was a cadet of the noble family of Hamilton of Dalzell, and was born at his father's farm of Boogs or Bogs, in the parish of Bothwell, Lanarkshire, some twenty years or so before the close of the seventeenth century. Nothing is known of his boyhood, but it is conjectured that he entered the University of Glasgow, and that it is his name which appears among the signatures to a protest drawn up in 1696 denouncing conspiracies against the life of William III. He, having fallen in love with his cousin Anna, the daughter of Robert Hamilton of Wishaw, joined the Company's service in 1709, no doubt as many a young man had done before him, in order to gain a speedy competence with which to return home and marry. He was appointed surgeon to the frigate "Sherborne," Captain Cornwall, a 250-ton boat carrying twenty-two guns. Cornwall was honest, energetic, and persevering, but possessed no tact, no self-control, and no ability. He had had a somewhat chequered career both in the Royal Navy and the Company's service, and, having missed promotion in both, was naturally a disappointed man. The "Sherborne" left England some time in February 1710, and, with the crew on the verge of mutiny owing to the captain's harsh treatment, grounded on a shoal off the island of Ceylon on 1st September. While the captain was away in search of aid, most of the crew deserted the ship, and on meeting him on his return with some Dutch sloops he had induced to come to his aid, were only persuaded to go back to duty on receiving their papers of discharge. The ship finally reached Calcutta on the 16th October. At this port an inquiry was held, matters were temporarily patched up, and the "Sherborne" was ordered to Madras. Here it was found that out of her full complement of fifty men, there were only nineteen on duty—a significant enough commentary upon the state of matters aboard. On the 3rd March 1711, however, the ship sailed for Cuddalore with reinforcements for the English, who were at that time engaged in hostilities with the Rajah of Jingi.

Whatever part Hamilton may have played in connection with the miserable disputes between the captain and the crew, he stuck to the ship and his duty until she arrived at Cuddalore. Here, however, his patience seems to have given way, for, representing that the Government had given him permission to go to Madras, and producing a letter from his kinsman, Captain Hamilton, in confirmation of the statement, he deserted the ship on the 3rd May 1711, and made his way to Madras in a native boat. (I may be pardoned for mentioning, at this point, that the said Captain Hamilton gives the following graphic, if somewhat ironical account in his narrative of the hospital at Calcutta about 1720. "The Company," says he, "has a pretty good hospital at Calcutta, where many go in to undergo the penance of physick, but few come out to give account of its operation!") On his arrival at Madras, Dr. Hamilton was haled before the Council, who had heard of his defection from Captain Cornwall, and ordered to rejoin his ship. This he did not do, but continued his flight to Calcutta. "In the ledger of the 'Sherborne,'" says Dr. Wilson, "the account of William Hamilton, chyrurgion, is closed with the scornful word 'run.' And his life's reckoning might well have closed with the same shameful entry, were it not that the Divine Accountant is more long-suffering than man. Hamilton lived to rue bitterly the false step he had taken, for in leaving his ship he left for ever home and country, father and kindred, and all that might have been, had he returned to marry his Anna and make his name as a great doctor in the land of his birth (he is, I should have mentioned, everywhere alluded to as a man of great ability). Yet he lived to wipe out the memory of his false step by actions which brought lasting benefit to his nation." In December 1711 he was appointed Second Surgeon to the Agency at Calcutta, and on the 5th January 1714 he was ordered to accompany the Surman Embassy to Delhi. He was given 300 rupees to furnish himself with clothes, and probably started for Patna in April. So many delays occurred here, the Embassy did not get away until the 6th April 1715, and then took three months to perform a journey (each man in a jolting palanquin "slightly plated with silver") which, nowadays, takes but a few hours by train. The history of the Embassy is faithfully related by John Surman in his Diary, and it is a record which shows the folly of the Council at Calcutta in having chosen such young and inexperienced ambassadors. They invariably seem to have bribed the wrong courtiers, who promised them everything and performed nothing, or to have failed to grasp the proper official procedure by which to gain audience of the Emperor. Indeed, it seems to me, reading between the lines, that had it not been for William Hamilton the business could never have been brought to a successful termination. That able practitioner very soon made a name for himself at Delhi, and that in spite of the jealousy and active opposition of the Emperor's French physician, Mons. Martin, and the many native doctors. His first important patient was the Lord High Steward, who was suffering from consumption, or, as some said, from the Divine retribution. He had sworn an oath upon the Koran, but having broken it, his right hand began to wither. Hamilton took up his abode with him on the 25th July, but soon pronounced the case hopeless. He attended Farrukh-Siyar himself a little later on, and speedily cured him of some swellings in the groin. On the 30th September we are told that the Lord High Steward "having gratified Hamilton, dismissed him, and took other doctors!" How little have times changed! On 3rd October Hamilton had an interview with the Empress Mother on the subject of His Majesty's health. He was then suffering from a violent pain, which it was thought might turn to fistula. This time Hamilton took seven weeks to effect a cure, and in the meantime ran no little risk of assassination at the hands of the infuriated populace, who had been told — no doubt the rumour was spread by the envious Mons. Martin and his native confrères — that the King had died under Hamilton's hands. On 20th November, however, "all the plasters having been removed," Farrukh-Siyar washed himself and received the congratulations of the whole Court, and, a week afterwards, publicly presented Hamilton with "a vest, a culgi set with precious stones, two diamond rings, an elephant, horse, gold buttons set in jewels for coat, waistcoat, and breeches, 5000 rupees, and models of all his surgical instruments in pure gold." The King likewise begged him "to demand something that was the most at his heart, for that there was nothing that he would refuse him"; whereupon Hamilton, following Boughton's example, prayed him to grant the requests of the Embassy. This the Emperor gave his promise to do, and did, after a very considerable delay, due partly to the inexperience of the Ambassadors, and partly to the festivities attending His Majesty's marriage with the daughter of a Rajput Prince, who, I forgot to mention, had already arrived at Delhi in readiness for the ceremony some months before! The firman granted confirmed all the original privileges of the Company, permitted the President to issue passports exempting goods from search throughout Bengal, allowed the use of the mint at Murshedabad, and permitted the Company to buy thirty-eight additional villages near Calcutta. But I must hasten to the end of my paper. On the 12th May 1716, Hamilton once again saw the Emperor, but found nothing wrong with him. In September he saw the Grand Vazir once or twice, and in April 1717 he attended that dignitary's uncle's wife. On the 28th May the Ambassadors, having had the great seal of state affixed to the firmans, were graciously permitted to take leave of the Emperor in public audience. One by one they filed past Farrukh-Siyar, who sat upon the famous Peacock Throne, surrounded by a glittering throng of native nobles—a veritable vision of all the glorious pageantry of the East, and as each man was invested with a dress of honour he made obeisance to the Great Moghul. Hamilton, who brought up the rear, had just made his bow when a dramatic event occurred. A command from the Throne bade him resume his place; the vest which had been bestowed upon him was but an evidence of royal favour, and gave no permission for his departure! One can but dimly realise Hamilton's feelings, but we know that assuredly he did not, as Viola, sit

"like Patience on a monument,
Smiling at grief."

Over and over again he was begged to remain in the service of the Great Moghul, but over and over again he passionately refused. "We are satisfied," says Surman, "that should he be kept by force, his stay would be no longer than the first opportunity to elope. For such a burning desire runs in him after his own country (he had written early in 1716, telling his people and Anna to expect him home soon 'rich and famous') that neither promises nor threats can avail anything." Finally, he importuned Farrukh-Siyar in a touching petition to allow him to go, and, to his great relief, received the following answer on the 6th June: "Since he is privy to my nakedness and perfectly understands his business, I would very willingly have kept him and given him whatsoever he should have asked. But seeing he is satisfied with no terms, I agree to it provided that after he has gone to Europe, procured such medicines as are not to be got here, and seen his wife and children (these, I conclude, must have been trumped up for the occasion!), he return once more and revisit this Court. Let him go." While on the way from Delhi to Calcutta, Hamilton must have felt that his health was giving way, for, on the 27th October, in a boat on the Ganges, he made and signed his will, by which he made generous bequests to his father, his cousin Anna, several friends, and the church in Bengal, and appointed John Surman to be his trustee. He died on the 4th December, shortly after reaching Calcutta, and was buried in the old cemetery by the fort green. It is related that Farrukh-Siyar—who, by the bye, ended his reign tragically enough, being brutally blinded and afterwards murdered some three years later—refused to believe that Hamilton was dead, and sent an officer of high rank to make inquiries. This personage composed the epitaph which is to be seen upon Hamilton's tombstone to this day. The tombstone was removed in 1787, when the foundations of St. John's Church were being laid, and was finally placed, in 1802, in the Mausoleum erected over the graves commemorating the names of Job Charnock, the founder of Calcutta, and two of his daughters.

The epitaph runs as follows:—

"WILLIAM HAMILTON, Physician in the service of the English Company, who had accompanied the English Ambassador to the Enlightened Presence, and having made his own name famous in four quarters of the earth, by the cure of the Emperor, the Asylum of the World, Mohammed Farrukh-Siyar the Victorious; and, with a thousand difficulties, having obtained permission from the Court, which is the refuge of the universe, to return to his country; by the Divine decree, on the fourth of December 1717 died in Calcutta, and is buried here."

It is probable that Boughton and Hamilton never received more than £30 per annum for their services to the Company. Messrs. Miles and Dodwell pertinently ask, "If Walpole judged rightly, that every man has his price, we wonder at what rate these two poor gentlemen would have forfeited their integrity."

With this we may take our leave of this record of two worthy lives. We have only to realise to ourselves the unsettled state of the times, no less than the innate barbarity, however thickly veneered it might be by cunning smile or sugared word of the old-time courtiers at the Moghul Court, to understand the daily risks our two heroes ran in the service of monarchs who had assuredly more cause than our own King John to say:

"It is the curse of kings to be attended
By slaves that take their humours for a warrant
To break within the bloody house of life,
And on the winking of authority
To understand a law, to know the meaning
Of dangerous majesty, when perchance it frowns
More upon humour than advised respect."

All honour then to their memories. We, as medical men, may well be proud to belong to that profession which claims as not the least among her noble sons those two able, generous, and patriotic surgeons of the old East Indian Company—Gabriel Boughton and William Hamilton.

REVIEWS OF BRITISH AND FOREIGN LITERATURE.

Epilepsy: A Study of the Idiopathic Disease. By WILLIAM ALDREN TURNER, M.D. London: Macmillan & Co. Ltd.

THE time had arrived when another systematic treatise on epilepsy was due. A closer study of the disease, both from its bodily and its psychic and conduct aspects, had added to the light which the older authors were able to throw on this dread affection. Dr. Turner has written an admirable work. It is careful, honest, reliable, and up to date. It also has the merit of being within a reasonable compass. Its 266 pages, well printed on good paper, can be comfortably read by even a busy practitioner. The wealth of writers on epilepsy, from Hippocrates downwards, is most difficult to deal with by any new author, but Dr. Turner has steered the happy course between too much quotation and too little. No doubt, in some parts of the book, he allows himself to be somewhat overweighted by other authorities, and we do not get that vigorous individual opinion, the result of experience and thought, which is the charm of a really first-rate medical book. Dr. Turner has been fortunate in his professional experience of epilepsy. The combination of private practice, such hospital practice as is to be got in the National Hospital, Queen's Square, and such experience as is obtainable in the Chalfont Colony for Epileptics, is not obtainable by many physicians. We have often had a desire to see a book which was the author's and the author's only, in experience and in diction, with a superadded section giving the opinions of other authorities, but this seems a scarcely realisable ambition in medical literature. Dr. Turner's book is perhaps the first in England where the psychic and the conduct element is made to bear a due clinical relation to the motor and to the bodily symptoms. He says, "The mental condition is not solely a consequence of the seizures, but is an expression of the same nervous constitution which gives rise to the seizures." At least one psychiatric author has expressed this view of the disease. It is absolutely certain that epileptic dementia is not only allied to, but is the same condition as ordinary terminal dementia. The author brings out strongly in his statistics another essential feature of epilepsy, namely, that it is a developmental disease, 82 per cent. of the cases beginning before 30 years of age. The psychiatric books made too much of the mental symptoms, and the neurological books took too little account of them Any study of epilepsy, to be a true one, must regard the disease as an organic whole with a marked solidarity of symptoms, like the brain itself.

Early in the book the author has a sub-chapter heading "Epilepsy an Organic Disease of the Brain." Now this is a little begging the question. The two views of epilepsy are—(1) That it is a disease whose essential nature consists in a physiological instability of the motor centres from hereditary defect. (2) That it is a disease with a distinct basis of organic brain cell changes. We have always inclined to the first view. Even in spite of Dr. John Turner's careful microscopic observations, we still adhere to that opinion. By this view the essence of epilepsy is a disturbed motor and mental reactiveness, a morbid condition which may be brought out by autotoxins, by poisons from the outside, by visceral disturbance, by mental shocks, or by traumatic injuries. The motor battery, in fact, in the cortex of the epileptic is so dangerously constituted, that an explosion may take place from any internal or external excitant, and may, in fact, "go off" when the ordinary accumulation of potential energy in the cell reaches a point at which a healthy cell is perfectly stable. The objection taken to this view is, how then do you explain the innumerable pathological changes that every author has noticed in the epileptic's brain? The answer is, that all those are sequential and secondary; that the cell disturbances, the neuroglia disturbances, and the vascular disturbances which necessarily happen during every epileptic fit are necessarily followed by organic change. It may be said, too, with truth, that no two writers agree as to the essential pathological changes which are the assigned cause of epilepsy, their *locus*, their kind or their amount.

The chapter on "Pathological Anatomy" is written by Dr. John Turner of the Essex Asylum, one of the most expert and reliable microscopists in the country. He attributes the disease to an intravascular clotting and thrombi.

When the author comes to the question of the treatment of the disease, we think he is entirely to be relied on. While Dr. Turner refers to Dr. Hughes Bennett's systematic experiments in the use of the bromides, he does not mention the still earlier experiments of Dr. Clouston in 1867, which were the first to give the scientific facts as to the proper dosage of the drug and the extraordinarily favourable effects which it can produce in certain cases. We recommend this book, not only to the specialist, but to every practitioner of medicine.

A Treatise on Diseases of the Anus, Rectum, and Pelvic Colon. By JAMES P. TUTTLE, A.M., M.D. Second Edition. London: Sidney Appleton.

THERE is no change in the general plan of this work as compared with the earlier edition published four years ago, but it is kept well up to date, and should be as favourably received. The opening chapter, on the embryology, anatomy, and physiology of the region, is full, clear, and well illustrated. The modern scientific division of the lower part of the intestinal canal is followed. The anus or anal canal is very properly regarded as extending up to the free border of the semilunar valves, a limit which harmonises with the development, anatomy, and pathology of the part; the rectum ends superiorly at the point where a mesentery appears. In discussing malformations, the author believes that in complete atresia there is less shock to the infant when the operation is performed without the use of any anæsthetic; search by means of a trocar or aspirating needle in such cases is mentioned only to be condemned. The methods of rectal examination, the position of the patient, and the various instruments are detailed. The importance of the pneumatic proctoscope and sigmoidoscope, in which the author has made useful improvements, is rightly emphasised. Kelly's sigmoidoscope, though passed blindly by touch, and depending on external illumination, was a great advance on older methods; but the pneumatic instrument, which carries its own lamp, is passed by means of sight, and balloons the bowel in front, marks still further progress in the direction of safety and efficiency.

Inflammatory and ulcerative conditions occupy a good deal of space, and the only noticeable omission is the failure to mention appendicostomy as a substitute for opening the cæcum in those cases of colitis requiring lavage of the bowel from above. Fissure in ano, if the base be not indurated nor the sphincter hypertrophied, may often, as the author points out, be cured by the application every other day of pure ichthyol, preceded by a local anæsthetic; except in such cases, operation is required, and should the external sphincter be divided in this or any other operation, the incision should be at right angles to its fibres, for oblique incisions tend to leave diminished control or incontinence. The chapters upon perianal and perirectal abscesses, with their not uncommon sequela fistula in ano, are excellent. Excision of the fistula, with immediate suture, is the operation preferred, unless the track is long or complex. For non-malignant stricture, complete proctotomy is regarded as the best of a rather unsatisfactory series of methods of treatment. If bougies are used, a speculum should be passed up to the stricture, and the bougie introduced under the guidance of the eye, and not of touch alone. A complete and impartial description of the operative treatment of internal hæmorrhoids is given, and many surgeons will agree with the author that the clamp and cautery method, from its general applicability, ease, celerity, and uniformly good results, is the best. Speaking of the ligature operation, the safety and efficiency of which he fully admits, he says that he "does not remember a single case where this method was used in which it was not necessary to catheterise the patient for some days, or even weeks, afterwards." This sounds an almost incredible statement, and is far from being true in the experience of surgeons in this country. Benign tumours are more fully described than usual; and the various methods of extirpation of the rectum for malignant growths, the comparative mortality of the routes, and the cases suitable for each, are judicially stated; the statistics show that women stand the abdominal route better than men. The concluding chapter of the volume is a short one on recto-colonic alimentation.

A number of errors in Latin declension running through the book might have been corrected, but in a review of so important a work any detailed reference to these would be out of place. The book is complete, eminently readable, and free from any offensive self-assertiveness. We need only repeat the opinion expressed in these pages regarding the first edition, that it holds the foremost place among works devoted to this branch of surgery.

Handbook of Diseases of the Eye. By Swanzy and Werner. Ninth Edition. 1907. London: H. K. Lewis.

Among the books of moderate size dealing with diseases of the eye, there are few which rival the familiar "Swanzy" in thoroughness, conciseness, and clearness. Its continued popularity is shown in the fact that now a ninth edition has been called for, which this time appears under the joint authorship of Mr. Swanzy and Mr. Werner.

The chief improvements are the introduction of a chapter upon elementary optics, greater completeness in the treatment of optical questions, and more details of the bacteriology of conjunctivitis. The number of illustrations has been greatly added to, and some of the letterpress which, in these days of rapid progress, had become obsolescent, if not obsolete, had been omitted. If the book has a fault, it lies in an endeavour to include too much; it is a difficult fault to avoid, for no one wishes to lay his work open to the criticism of incompleteness. It is, however, to some extent diminished by the system adopted of marking with an asterisk paragraphs which are of minor importance, and which the student may without disadvantage omit. The perusal of the new edition confirms the view of its excellence which we already firmly held.

The Bacteriology and Etiology of Oriental Plague. By E. KLEIN, M.D., F.R.S. London: Macmillan & Co. Ltd.

THIS book is a collection of the results of the various studies of *B. pestis* carried out by Dr. Klein during the last ten years, and published in the Annual Reports of the Medical Officer of the Local Government Board. They deal with the characters of the *B. pestis*, and the means of distinguishing it from other bacteria which resemble it; and they give a very full account of plague as it affects rats and other animals. The last three chapters deal with agglutination of, protective inoculation against, and modes of destruction of *B. pestis*.

The book will be welcomed by all workers on the subject. Coming as it does from one so well qualified to write on the subject, it is not surprising that a great deal of very valuable advice is given to all who have in any way to deal with cases of plague. Especially would we emphasise his insistence on a complete bacteriological examination in all cases. Some of the cases he records in which a diagnosis was not made (and in which epidemics might quite easily have been set up), merely on account of imperfect examination, seem to justify very strong strictures. The number of inexperienced bacteriologists has of late greatly increased, and it is therefore all the more important that a book such as this should be at hand as a guide.

We do not agree with all Dr. Klein says, and our experience in infecting animals by feeding has not been so unsuccessful as that of other workers.

In regard to staining, we think the one Dr. Klein prefers is complicated, and that quite as good and as beautiful results are got by Jenner's stain, which certainly has the merit of simplicity.

He rightly insists on the examination of the organism unstained, in "hanging-drop" preparation, and the examination in plate cultures, both usually neglected.

The book is well written, and the publishers must also be congratulated on the text and the reproduction of the photographs. It is one of the most valuable additions we have had for some time to the literature of Oriental plague.

Lectures on Auto-Intoxication in Disease, or Self-Poisoning of the Individual. By Professor Ch. Bouchard, Paris. Translated, with a Preface and New Chapters added, by Thomas Oliver, M.A., M.D., F.R.C.P. Second Edition. Philadelphia: F. A. Davis Company.

We very heartily welcome the second revised edition of this book. Much new matter has been introduced in various parts of the text, and this has brought the book well up to date. Two new chapters have been added by Professor Oliver—one on "The Natural Defences of the Organism against Disease," and the other on "Auto-Intoxication of Intestinal Origin." These are of necessity short, but both give a very able summary of much recent research on these subjects. The importance of the various subjects dealt with needs no defence, and we feel specially grateful that, at a time when the tendency in many quarters is to attribute most pathological conditions to the action of bacteria and their toxins, this edition of Bouchard's work has appeared; for without minimising the importance of bacterial products in the production of disease, it gives very much needed emphasis to the perhaps more important rôle of the products of normal or abnormal metabolism. The book brims over with suggestive lines of research, and one cannot read it without feeling that a great and valuable field for investigators has been opened up.

Professor Oliver must be congratulated on again bringing before us these lectures, and it is no disparagement to Bouchard's work to say that we consider the lectures much improved by the additions made to them by the translator.

Pathogenic Micro-organisms, including Bacteria and Protozoa: A Practical Manual for Students, Physicians, and Health Officers. By William Hallock Park, M.D., Professor of Bacteriology and Hygiene, University and Bellevue Hospital Medical College, and Director of the Research Laboratory of the Department of Health, City of New York. Second Edition. London: Henry Kimpton.

The extensive additions which have been made to our knowledge of bacteria and protozoa within the past few years have led to the second edition of this useful work being thoroughly revised and considerably enlarged. Its contents are arranged in three sections. In Part 1, dealing with the principles of bacteriology, the general characteristics, morphology and structure of bacteria, and their classification and chemical composition, are considered. Here, too, are discussed such subjects as the methods of microscopic examination and of disinfection; while the remaining chapters treat mainly of the uses of animals for diagnosis, the methods of obtaining material for examination, the relation of bacteria to disease, immunity, and agglutination.

The second part of the book is devoted to the study of the individual bacteria which are pathogenic to man, and the morphology, biology, pathogenesis, occurrence and differential diagnosis of each micro-organism is very fully described. For the isolation of typhoid bacilli from suspected fæces, urine, water, etc., the methods of Hiss, Capaldi, and von Drigalski and Conradi are recommended. In the chapter on diphtheria, it is pointed out that Neisser's stain is by no means an infallible test for the differentiation of diphtheria from pseudo-diphtheria bacilli. Two interesting chapters on the bacteriological examination of water, air, and soil, the contamination and purification of water, the disposal of sewage, and the bacteriology of milk in its relation to disease, close this portion of the work.

Dr. Anna W. Williams writes the whole of Part 3, dealing with the protozoa, except the chapter on malaria, which is contributed by Mr. L. B. Goldhorn. *Spirochæta pallida* is fully considered, but we find no mention of *S. refringens*. The protozoan-like bodies in smallpox and allied diseases, and in scarlet fever, receive due notice.

The work, which is well up to date throughout, and remarkably free from printer's errors, is one of the best treatises on its subject; and though it has been specially written for students and practitioners, we feel sure that it will be of equal, if not greater, value and assistance to the laboratory worker.

Transactions of the Clinical Society of London, Vol. XXXIX. London: Longmans, Green, & Co. 1906.

The *Transactions of the Clinical Society* always prove interesting and instructive, and the present volume is no exception to the rule. About two-thirds of the papers deal with surgical conditions, and the majority of these relate to the surgery of the abdomen, in which there is more progress to be recorded than in any other branch of surgery. We may instance those on rupture of the spleen, peritoneal complications of typhoid fever, cysts of the pancreas, torsion of the omentum, cancer of the stomach, duodenal hernia, Treitz's hernia, and gastric ulcer, as illustrating the interest which is taken in the surgery of the abdomen. There are a sufficient number of illustrations, including skiagrams, to materially add to the value of the *Transactions*.

NOTES ON BOOKS.

In his *Lectures on Massage and Electricity*, sixth edition (John Wright & Co., Bristol), Dr. Dowse expounds very fully the principles and practice of massage and the therapeutic applications of electricity. He is enthusiastic in praise of his favourite remedies, and takes a decidedly optimistic view of their powers as curative agents. On p. 97, for instance, we are told that cases of progressive muscular atrophy, given up as hopeless, have been cured by massage, a statement which should be supported by more real evidence than is given if Dr. Dowse wishes it to carry conviction; while the list given of the wonderful powers of the "Electric Abdominal Compress" on p. 173, is strongly reminiscent of the advertisement columns of a daily paper. Dr. Dowse makes strenuous efforts to place his theories of the action of massage and electricity on a sound basis, and in so doing discusses many complicated problems in physiology and pathology, and develops a number of nebulous theories regarding the diseases which should, he maintains, be treated by massage. As an instance may be cited the novel theory of autogenetic infection propounded on p. 137. The book, as a whole, contains much useful information about massage, with a number of interesting clinical illustrations, but there is too much controversial and really irrelevant matter, the true value of which could be appreciated by medical men, but not by the large number of persons who practise massage in this country without having had any proper medical education.

Dr. Bezly Thorne's name is so well known as that of one of the principal exponents in this country of the value of baths and exercises in the treatment of heart disease, that those who wish to know how they are best applied will almost instinctively turn to his *Schott Methods of the Treatment of Chronic Disease of the Heart* (J. & A. Churchill, London), of which the fifth edition lies before us. Like its predecessors, the new issue gives a clear account of the *rationale* of the treatment, and contains many clinical records, pulse tracings, etc., illustrative of the results in suitable cases. The principal changes in the fifth edition concern the applicability of the baths and exercises to aortic regurgitation, Raynaud's disease, and exophthalmic goitre, in which direction Dr. Thorne's experience is that they deserve more extended employment.

When it is stated that the membership of the Association of American Physicians is a limited one, and includes on its roll scarcely a name which is not conspicuous in the realm of medicine or the ancillary sciences, it will readily be understood that the twenty-first volume of the *Transactions* (printed for the Association, Philadelphia), which has just appeared, contains papers of more than ordinary weight and merit. The seventy communications included in the volume cover medicine, therapeutics, pharmacology, bacteriology, and pathology, and are, in nearly all cases, records of original research by the best-known American workers. It would require a long review to deal fully with the many interesting points raised; but even this notice is enough to let it be seen that the *Transactions* reach an exceptionally high standard.

That "what is one man's meat is another man's poison" is true of many things, even of health resorts, was the reflection which came to mind in reading *Davos as a Health Resort* (Davos Printing Co. Ltd.) and *Helouan as an Egyptian Health Resort* (Longmans, Green, & Co., London). For, according to Dr. Phillipi, one of the collaborators in the production of the former volume, and Dr. Hobson, the author of the latter, if, by reason of gout, emphysema, rheumatism, or neurasthenia, you should avoid Davos, you may safely winter in Helouan. Both books are attractively got up and well illustrated, and give useful accounts of facilities, both for cure and for enjoyment, which the two places offer.

The seventh volume of the *Reports of the Presbyterian Hospital, New York* (Trow Directory Printing and Bookbinding Company, New York), contains a number of papers of considerable medical and surgical interest, nearly all of them dealing purely with clinical topics and cases.

Dr. Hugh M'Laren, the editor, is to be congratulated on the appearance of the fifth volume of the *Transactions of the Medico-Chirurgical Society of Glasgow* (Alexander Macdougall, Glasgow), in which is recorded a useful session's work. Among a number of other valuable communications, the volume contains Professor Muir's illuminating paper on leucocythæmia and its allies, an excellent paper by Dr. Nicoll on hernia, and an important discussion on infant mortality.

RECENT ADVANCES IN MEDICAL SCIENCE.

MEDICINE.

UNDER THE CHARGE OF

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Epidemic Cerebro-Spinal Meningitis.

Transmission of the Contagion of Epidemic Cerebro-Spinal Meningitis.—Two very interesting and instructive papers on this obscure subject, by Jehle, appear in the *München. med. Wchnschr.*, 1906, No. 29, and the *Wien. klin. Wchnschr.*, 1906, No. 25. The writer was commissioned to investigate two epidemics occurring in the mining districts of Orlau and Neumühl. He noted, what has already struck other observers, that cases which occurred in rapid succession in point of time, were often separated from one another by such distances as to put the idea of direct infection out of court. He therefore concluded that children, who form the great majority of the patients, cannot be the carriers of the infection from one person to another. Were they so, school epidemics, and localised outbreaks in public playgrounds, common stairs, etc., where children congregate together, would be of frequent occurrence, whereas quite the reverse is the case. Jehle therefore looked to the adults of the community in his search for the carriers of infection. In the districts under his supervision there were various mining villages, the inhabitants of which worked in different mines, so that in each village there were workers in several mines, and in every mine dwellers in several villages. He found that the children who fell victims to cerebro-spinal fever were nearly all members of the families of miners who worked in one or two particular mines, while neighbouring children, whose parents worked in other mines, escaped. Orlau, the district in which this observation was made, is free from railways and steam-trams, so that intercommunication of this kind does not complicate the question. Mines, therefore, according to this view, play the same part in spreading the infection of cerebro-spinal fever as schools do in respect of measles, etc. A mine is a warm, damp, sunless locality, and these characters favour the growth in it of the meningococcus. The miners become infected with the meningococcus without themselves taking the disease; it flourishes particularly in the post-nasal space, dying out quickly in the anterior part of the nasal cavity; hence, in order to expel it into the air, sneezing and hawking are necessary. Miners as a class are prone to catarrh, in which sneezing, etc., occurs; hence they readily diffuse the germ about their houses; this, too, is why cerebro-spinal fever is most prevalent during the colder season of the year, when colds are most common. Children, on the other hand, do not hawk or sneeze; hence even when they have meningococci in the naso-pharynx, they are not sources of danger to their fellows. The observations made at Neumühl confirmed those made at Orlau. At Neumühl there are two principal mines, the workers in which inhabit two separate villages, between which, however, there is very free intercommunication by rail and tram. For the first five weeks of the epidemic the cases were limited to one of these villages; but from the 10th February onwards, cases cropped up in the second village, and then the epidemic became general. During the first period not a single miner had been transferred from the first to the second mine; early in February, however, some men left the infected mine and went to work in the other; ten days later the disease appeared in the village in which workers in the second (hitherto uninfected) mine lived. Further investigation also showed that certain galleries were more highly infected than others. This theory of the epidemiology of the disease—that adults are the chief transmitters of the infection, while children, though the principal sufferers, are less dangerous to their neighbours—explains why, when several children in one house are affected, they are usually seized with the disease almost simultaneously, while in garrisons, etc., where adults are congregated together, the disease affects one person after another. In the first case, the outbreak is due to a common source of infection; in the second, there is infection from one person to another. As a corollary to these observations, Jehle believes that all disinfection of houses, isolation of children affected, closing of schools, etc., is, to a large extent, energy wasted. The line of action should be to isolate the parents of infected children and workers in infected mines, and to take steps to rid them of the germ. This can speedily be done by regular irrigation of the nose with pyocyanase, which is by far the most effective remedy, as it is not usually necessary to make more than three applications or to keep the miner away from work for over four days. The other precaution is to debar those working in an infected mine from being transferred to an uninfected mine until they have undergone quarantine and disinfection.

Symptomatology and treatment.—In a paper read before the New York Neurological Society, Leszynsky (*Med. Rec.*, N.Y., 1906, March 6) discusses the symptoms and treatment of cerebro-spinal fever; the communication is based on the records of thirty cases, representing nearly all the types of the disease. The mortality was 50 per cent.; the average age 11 years, and the average duration of the fatal cases a week. In all but one (a "dry tap") the *Diplococcus intracellularis meningitidis* was found in the cerebro-spinal fluid. It is a noteworthy fact that affections of organs other than the central nervous system are almost always secondary; the infection process rarely attacks the viscera,

—"the diplococcus does not produce a general septicæmia" (Councilmann). After giving the case histories in some detail, Leszynsky analyses some of the chief symptoms:—(1) *Herpes and petechial eruptions* have no particular influence as regards prognosis; in eight of the cases which recovered herpes was present, thrice accompanied by petechiæ. It is not, therefore, specially unfavourable. (2) *Rigidity of the neck* was absent in two cases only; general rigidity with opisthotonos was present in three recoveries, and in one fatal case. In five cases there was extreme extensor rigidity of the lower extremities. (3) *Bladder and rectum.*—Loss of control of the sphincters was not occasioned by the meningitis *per se*, but was solely due to the condition of the sensorium, and occurred only along with delirium and stupor. (4) The *knee-jerks* were abolished in fourteen cases, of which half died. Withdrawal of the cerebro-spinal fluid did not always bring about a return of the jerks. During convalescence the knee-jerks were usually slightly exaggerated. In other forms of meningitis there is usually increase of the knee-jerks. (5) *Kering's sign* was absent in three cases; it was found in twelve fatal cases, and in fifteen which recovered. The phenomenon is the result of the patient's resistance to painful dragging on the sciatic nerve or spinal roots involved in the exudative process. (6) *Babinski's sign* was found in only ten cases, some of these being young infants in whom the extension is physiological. (7) *Facial paralysis*, with loss of faradic irritability, was present in four fatal cases. (8) *Deafness.*—The auditory nerve was involved in three recovered and two fatal cases. (9) *Ocular symptoms.*—Optic neuritis was detected only twice; among other eye symptoms noted were abolition of the pupillary light reflex, horizontal and vertical nystagmus, paralysis of the third nerve, keratitis and perforation of the anterior chamber, iridocyclitis, choroiditis causing blindness, hyperæmia of the conjunctiva, convergent and divergent strabismus, bilateral exophthalmos, conjugate deviation. Exophthalmos is a rare symptom, which has seldom been recorded. It was more prominent than in an ordinary case of Graves' disease, and was apparently due to hyperæmia of the retro-ocular tissues; it was accompanied by suffusion of the conjunctiva, and maximal dilatation of the pupils, and was not relieved by lumbar puncture. Severe eye symptoms are chiefly met with in fatal cases, and are of grave prognostic significance.

Prognosis.—The symptoms which are most unfavourable, and presage a fatal termination, are: protracted stupor or coma with slow pulse; subnormal temperature with general muscular flaccidity; persistent coma with high fever and extreme rigidity after the first week; exophthalmos and widely dilated pupils.

Treatment.—The chief remedies which Leszynsky found efficacious were hot baths at a temperature of 105° for fifteen or twenty minutes at a time, repeated at intervals of a few hours. These allayed restlessness and spasm. Warm saline rectal or subcutaneous injections were employed to restore vitality. Among drugs, he rates ergot first. It must be given hypodermically, not by the mouth, to be of use. It was given as a routine every three or four hours in the later cases, with happy results. He speaks less favourably than most writers of morphia, and discarded it in the later cases. Ice bags were of little value. *Lumbar* *puncture* was never followed by any unpleasant consequences. The meningococcus may not be found at the first examination, yet be detected subsequently. The diagnosis can usually be made without lumbar puncture, except in cases with subnormal temperature and complete muscular relaxation, in which it is essential. Lumbar puncture is of therapeutic value in temporarily relieving the intracranial pressure, but not otherwise. Two patients recovered who were given intraspinal injections of lysol (1 per cent. and 10 per cent. solutions); it was tried without avail in several fatal cases.

Koplik (*ibid.*, 1906, September 29) discusses *percussion of the skull as a guide to the therapeutic performance of lumbar puncture*, especially in cerebro-spinal meningitis. The purpose of the paper is to fix definitely the therapeutic applicability of the procedure,—as to when, and how often, it should be performed,—a matter about which the statements of text-books are somewhat vague. It may relieve the headache, delirium, etc., in certain cases, but in other cases the same symptoms may be present, and yet lumbar puncture be in no way called for. It is said that lumbar puncture should be performed for the relief of pressure at the base of the brain, but the symptoms this produces may be exactly simulated by the results of toxæmia. Given a case of meningitis, the first result of the increased intracranial pressure is distension of the cerebral ventricles, and the early detection of this is the first indication for lumbar puncture. Acute or chronic hydrocephalus may be detected by percussion of the skull, as M'Ewen pointed out. When the lateral ventricles are distended with fluid, the percussion note of a given spot on the cranium varies according to the position of the head. When the patient sits upright, the most resonant note is yielded over the squamous part of the parietal bone. When the head is inclined to one side, percussion over the lower squamous parietal area gives a hollow, tympanitic note, which is easily recognisable after a little practice. When there is a greater degree of distension, the whole skull is tympanitic. Unless there is evidence (and this can be obtained in no other way than by percussion) of an increase of the fluid in the ventricles and subcutaneous space, no good can follow tapping. Koplik regards as rather unscientific the idea of drainage by lumbar puncture proving beneficial, since in meningococcal cases the disease is self-limited. The tympanitic quality of note described is of service in distinguishing between acute hydrocephalus from any cause, and the cerebral symptoms (meningism) common in pneumonia. As to the repetition of lumbar puncture: If the symptoms subside, it is best to delay tapping again, even though the tympanitic note remains; if they return, or if the remission is slight, puncture again. It sometimes happens that in spite of repeated puncture the fluid reaccumulates, and although the signs of hydrocephalus are present, less and less fluid can be withdrawn by successive tappings. These cases are hopeless, as there is great matting at the base of the brain blocking the flow from the central ventricles into the subarachnoid space.

SURGERY.

UNDER THE CHARGE OF

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Papillary Cyst Adenomata of the Breast.

A series of twenty cases of this condition have been examined clinically and microscopically by R. B. Greenough and C. C. Simmons (*Ann. Surg.*, Phila., 1907, February). These tumours have been described by various names, namely, adenoma, duct papilloma, duct cancer, villous papilloma, cystadenoma intra-canaliculare, proliferous cysts, etc. They may be single or multiple, and involve the large ducts near the nipple. They are composed of one or more cyst cavities, from the walls of which grow papillary outgrowths composed of a fibrous tissue stroma and a luxuriant growth of duct epithelium in the form of irregular gland tubules and polypoid projections. They occur in the male breast as well as in the female. They occur at all adult ages—the youngest patient in this series was 19, the oldest 81—and no gross or microscopic peculiarities were found to differentiate the tumours of younger women from those of older years. The male patient was 51 years of age. There is no traceable relationship between the tumour and injury, marriage, or lactation. The condition progresses slowly, and is painless; the growth is generally situated near to or beneath the nipple; and although usually of small size, the tumour may attain the dimensions of an orange. The most characteristic symptom is the presence of a discharge from the nipple, which may be serous, but is usually bloody in character. They do not cause any enlargement of the axillary glands, and the skin is not adherent over the tumour. Retraction of the nipple was observed in three of the innocent cases. Three out of the twenty cases (15 per cent.) were associated with a form of cancer (adenocarcinoma) of a relatively low type of malignancy. The treatment consists in complete removal of the tumour, either by excision, or, if necessary, by amputation of the breast. Excision may be performed by plastic resection, or by an incision below the areola.

Surgical Treatment of Cerebellar Tumours.

In a paper on the diagnosis and surgical treatment of cerebellar tumours (*Med. Rec.*, N.Y., 1906, December 26), B. Sachs remarks that the more one sees of cerebellar surgery the more one becomes convinced that the report of single successes leaves an incorrect impression upon the minds of medical men. The successes are the exceptions; and if a true account is to be rendered of what can be expected, the entire experiences of one or more men must be detailed without fear or prejudice. Sachs records the case of a man, æt. 36, who suffered from severe frontal headache over the right eye, increasing tinnitus of the left ear accompanied by deafness on that side, and daily vomiting. There was vertigo, and slight dragging of the left foot on walking, and double optic neuritis was present. Mastoid disease was excluded. Medical treatment yielded no benefit, and lateral and vertical nystagmus began to develop. A cerebellar neoplasm was diagnosed in the left half of the cerebellum. Operation was resorted to, and the cerebellum was incised and the finger gently inserted for exploration. The result was negative. The patient died eight hours after operation. Autopsy revealed a firm whitish tumour lying on the petrous portion of the temporal bone just over the internal auditory meatus.

In a second case, a boy, æt. 17, suffered from severe occipital headaches, daily vomiting, difficulties of speech and unsteady gait and giddiness, and double optic neuritis. A tumour affecting the left half of the cerebellum was diagnosed, but operation failed to reveal anything. About twenty minutes after operation patient began to breathe badly, and died of direct respiratory paralysis. Post-mortem examination revealed a tumour the size of a hen's egg lying in the posterior cerebellar notch. In not one out of twenty-two cases was surgical aid productive of cure, although several have been much relieved.

As regards symptomatology, cerebellar tumours present the symptoms common to all intracranial neoplasms, and double optic neuritis appears almost invariably at a very early stage, and this leads to total blindness. This and the severe headache which is always present renders trephining advisable for the relief of pressure at the earliest possible moment, and by this means many cases of blindness have been prevented and the optic neuritis has receded. This is illustrated by the case of a man, æt. 32, who had all symptoms of cerebellar neoplasm, with double optic neuritis and cerebellar gait. He was trephined over the occipital region, and the symptoms immediately lessened, the optic neuritis disappeared, and the patient was able to walk better. A month later a second operation was performed, but the tumour could not be found and the dura was sewn up and the scalp wound closed. In another month the patient was able to resume work. Many patients with cerebellar neoplasms live for years after the onset of the first symptoms, and in many the optic nerve is threatened from the outset, so that it is merciful to advise trephining at the very earliest stage of the disease. The probability of blindness is so great, that if the patient presents symptoms of cerebellar neoplasm, and also signs of rapidly increasing optic neuritis, an attempt should be made in every case to prevent blindness. The early development of unilateral or bilateral rectus externus palsy is to be given due consideration. The author regards this symptom as pathognomonic of cerebellar lesions if associated with symptoms pointing to increased intracranial tension. The evidence of these twenty-two cases indicates that, in walking, the patient sways towards the side on which the tumour is situated. Early involvement of the auditory nerve is of value in determining the site of the neoplasm. In view of the good results following prompt surgical treatment for relief of symptoms, it would be natural to state that much time is wasted by the routine administration of iodides and mercurials, and yet the author confesses that in several instances much has been gained by this practice. In three cases patients presented symptoms of cerebellar neoplasms, and after a few weeks gained practically normal health. While, therefore, on the one hand, it is most desirable not to delay operation for fear of impending blindness, yet, on the other, it is often advisable to be more conservative and to give the patient the benefit of the possibility of improvement taking place from drug treatment. When optic atrophy is advancing rapidly, however, the operation should not be delayed.

Spinal Anæsthesia.

Bier (*Centralbl. f. Chir.*, Leipzig, 1907, January 26) records his experience of over a thousand cases in which he has operated under spinal anæsthesia. He now uses 0·05 grms. of tropococaine in isotonic solution, without the addition of adrenaline. To produce anæsthesia as high on the body as possible, he dilutes the injection to the amount of 6 or 8 c.c., and this is best done with cerebro-spinal fluid. For the same reason the patient may be placed in the Trendelenberg position.

The author points out that among the dangers of the method are, firstly, the use of unsuitable drugs, of which he cites cocaine, stovaine, novocaine, alypin ; secondly, exceeding the prescribed dose, 0·05 grms. of tropococaine ; thirdly, faulty insertion of the needle and faulty injection. The drug should never be injected before the cerebro-spinal fluid escapes in a rapid series of drops or in a stream. If this is not attained by rotating or displacing the point of the needle, a fresh puncture should be made in the intervertebral space above or below that first tried. The patient should remain in bed for at least twenty-four hours after an operation performed under spinal anæsthesia.

A Case of Gonorrhœa of the Mouth.

S. Hyman (*N.Y. Med. Journ.*, 1907, January 26) reports a case of a girl, æt. 18, who complained of intense pain and burning in the mouth and cheeks, so severe as to prevent her taking food. There was a profuse discharge of foul-smelling, blood-stained fluid from the mouth. The tongue was swollen and painful ; the uvula, soft palate, and cheeks covered with a milky white membrane, which when removed left a raw, red, inflamed surface ; the gums spongy, and bled freely when handled. Microscopic examination of the discharge revealed mucus, epithelial and pus cells, round which were grouped staphylococci and gonococci. The local treatment consisted in the application of silver nitrate (1 in 250 at first, increasing to 1–50 later). In about five days the exudation ceased.

OBSTETRICS AND GYNÆCOLOGY.

UNDER THE CHARGE OF
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Radical Abdominal Operation in Carcinoma of the Cervix Uteri.

E. Wertheim (*Surg. Gynæc. and Obst.*, 1907, January) describes the technique of this operation as follows—(1) The patient being in the Trendelenberg position, the posterior layer of the broad ligament is divided and the ureters exposed as far as their entrance to the parametrium. (2) After dividing the peritoneum, the bladder is separated from the uterus. (3) Ligation of the infundibulo pelvic, broad and round ligaments. (4) Separation of the rectum from the vagina, followed by isolation and removal of the carcinomatous organ. (5) The latter step is effected by dividing the parametrium as close as possible to the pelvic wall, and transverse section of the vagina. (6) Every lymphatic gland which is found enlarged in the region of the great iliac vessels must be removed as far up as the division of the aorta, and down to the obturator foramen. (7) The cavity left after removal of the uterus is loosely filled with iodoform gauze, and the peritoneal cavity is closed by bringing together the anterior and posterior flaps of peritoneum.

Anatomy of Exfoliative Endometritis with reference to Clinical Conditions.

Aschheim (*Arch. f. Gynäk.*, Berlin, Bd. lxxx. Heft 2), after careful examination of seven cases of menstrual membrane thrown off by patients in his clinic, believes that such are the result of an acute exudative endometritis. Anatomically the membrane consists generally of a necrotic stroma, filled with leucocytes, with a fibrinous reticulum. The membrane forms in the intermenstrual period, and is thrown off about the third day. Remains of the uterine mucous membrane are generally to be found in the stroma of the exfoliated membrane, with some decidual cells. The etiological factors are general and local. General conditions causing exfoliation are anæmia, chlorosis, tuberculosis, and syphilis; the most frequent local conditions being fibroma, chronic metritis, parametritis, and abortion. Aschheim found no bacteria in the membranes examined by him. The chief symptoms were pain during the expulsion of the membrane, which generally occurs on the second or third day of menstruation. The condition is sometimes relieved by the occurrence of pregnancy, but in general is very intractable to treatment, only palliative measures being successful. Cauterisation of the endometrium gives unsatisfactory results, and the local treatment should be soothing rather than stimulating.

New Method of Treatment of Severe Eclampsia.

Sippel (*Berl. klin. Wchnschr.*, 1906, December 3) recommends decapsulation of the kidneys or incision of the capsule in severe cases of puerperal eclampsia in which after delivery the coma and convulsions continue. The author believes that the bad condition of the kidneys which causes the convulsion to persist is due to the obstruction of the general circulation and that of the kidney. In such instances the author has incised the capsule, with success in four cases. It should, however, be reserved for cases where coma or convulsions continue without relief from other means.

Prevention of Puerperal Mastitis.

Döderlein (*Ztschr. f. Gynäk.*, 1906, December 8) recommends the use of a solution of rubber in benzine to be painted over the nipple and areola, the area being then powdered with sterilised talc, an elastic covering being formed which may be washed with water or alcohol, as it is only soluble in benzine or ether. Döderlein has used it in 200 cases as a preventive to cracks and fissures. The infant takes the breast either directly or through a small glass nipple. This solution has also been found of use in abdominal operations to increase asepsis, and to hasten the healing of the wound. It is also recommended to prevent erosion of the skin by irritating secretions such as in urinary or fœcal fistulæ.

Influence of Early Rupture of the Membranes on the Course of Labour.

Caliri (*Riforma med.*, Roma, 1906, December 8) has examined the histories of 1770 cases of pregnancy at the klinic in Milan. Of those, in 968 the membranes ruptured on complete dilatation; in the remainder of the cases the rupture was premature. His conclusions are as follows:—(1) Early rupture of the membranes does not increase the dangers of the puerperium. (2) The mortality in the puerperium, if it appears to be greater in the case of rupture before complete dilatation, must be attributed to the operations frequently indicated by other conditions. The duration of labour, he asserts, is the same as it is with rupture at the time of complete dilatation, when no other cause operates to make it longer.

Uterine Hæmorrhage at Puberty.

Fischer (*Centralbl. f. Gynäk.*, Leipzig, 1907, No. 4) reports two cases—(1) P., æt. 12, first menstrual period lasted a week. Drugs failed to arrest the hæmorrhage, and the uterus was curetted. The mucosa appeared normal on microscopic examination. The child had

had a severe attack of epistaxis when 5 years old, and ecchymosis developed after slight injuries. The case was regarded as one of hæmophilia. (2) P., æt. 15, had metrorrhagia for six weeks; uterus curetted; death from epistaxis a fortnight later. Fischer reported twelve cases of severe metrorrhagia in patients between the ages of 12 and 17 years. In all there was no evidence of pelvic disease. Schauta, in discussing the paper, did not consider that such cases were to be accounted for by hæmophilia, as menorrhagia early in puberty was frequently associated with chlorosis, anæmia, or tuberculosis, and rarely terminating fatally.

Puerperal Eclampsia treated by Hypodermic Injection of Paraganglin.

Bellotti (*Gazz. d. Osp.*, Milan, 1907, January 20) reports a case of eclampsia in a woman, æt. 24, which appeared to be relieved by the injection of 2 c.c. of paraganglin. The case was first treated by morphine, and rectal injections of bromide of potassium and chloral, followed later by chloroform inhalations. As no relief was obtained, paraganglin was injected subcutaneously. Half an hour later, the patient sweated profusely, and passed copious urine. The injection was repeated, labour pursued a normal course, and there was no recurrence of the fits. Bellotti believes that the action of paraganglin is analogous to parathyroidin.

The Functions of the Ovaries after Total Extirpation of the Uterus.

Holzbach (*Arch. f. Gynäk.*, Berlin, Bd. lxxx. Heft 2) finds, as the result of his investigations, that the ovaries retain their full power of ovulation for many years after the removal of the uterus. If, however, manifestations of disturbance of function occur in those patients, other causes than the ovaries must be looked for. Extensive nerve relations between the individual organs may account for such disturbances. The author strongly recommends conservative treatment as far as possible, especially in operations for fibro-myomata of the uterus.

Operations for Recurrent Carcinoma of the Uterus.

Franz (*Arch. f. Gynäk.*, Berlin, Bd. lxxx. Heft 2) reports sixteen operations on twelve patients for recurrent carcinoma of the uterus, with one death. Seven patients left hospital healed, free from any discomfort, and apparently well; three had a vesico-vaginal fistula, and one a recto-vaginal and a vesico-vaginal fistula. The author recommends operation in every case of recurrent cancer of the uterus, except in those where the metastasis implicates large blood vessels.

THERAPEUTICS

UNDER THE CHARGE OF
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Cephaldol: a New Antipyretic and Antineuralgic Remedy.

This drug is a powder which is soluble in alcohol, but almost insoluble in water. Chemically it is formed from the action of citric and salicylic acids upon phenetidin, any free acid being neutralised with sodium bicarbonate or quinine. Einhorn has subjected the drug to an exhaustive trial. He has given it up to 60 grs. in the day. A single dose of 4 grs. has practically no action on a febrile temperature, but a larger dose of from 7½ to 15 grs. reduces the temperature promptly. This effect takes place within an hour, and in tuberculous cases is frequently associated with fairly profuse sweating. Free perspiration is also seen sometimes in erysipelas, and apparently the degree of sweating induced depends upon the weakness of the patient. The period of antipyretic action varies with the dose and method of administration. To reduce a febrile temperature to normal, we may give a single large dose, followed by smaller amounts, or instead small doses of 4 to 7½ grs. may be given every hour or so till the temperature reaches normal, limiting the amount in the day to 60 grs. No unpleasant effect has been observed upon the heart, circulation, kidneys, or cerebrum. Giddiness, ringing in the ears, deafness, or collapse have not been observed. On the other hand, in a few cases gastric disturbance was induced, varying from a sensation of cold to nausea resulting in vomiting. No case of skin rash or of diarrhœa has been observed. The effect of the drug upon the night sweats of phthisis is of some interest. Previous writers claim that cephaldol exerts an anhydrotic effect in the night sweats of phthisis. Einhorn found that a single dose of 15 grs., administered in the evening, as a rule produced rapid sweating; but this lasted only a short time, and was followed by a pleasant sensation of coolness, which enabled the patient to drop off to sleep.

The analgesic action of the drug was tested in various conditions. It is useless in acute rheumatic fever, but affords some relief in chronic arthritis, whether due to rheumatism or gonorrhœa. In certain systemic diseases it proved useful, notably in the lightning pains of locomotor ataxia, in a case of syringo-myelia, and in sciatica and hemicranial headache. In cases of purely functional headache, cephaldol is as reliable as other drugs of this type, but affords no relief in tumours of the brain or in meningitic conditions.—*Centralbl. f. d. ges. Therap.*, Vienna, 1907, February.

THE TREATMENT OF DIABETIC PHTHISIS.

THORSPECKEN points out that the prognosis of diabetic phthisis is not absolutely hopeless. The old dictum that in such cases the treatment of the diabetic condition is unnecessary, as the phthisis will inevitably prove fatal, is incorrect. Even in artificial culture the addition of sugar facilitates the growth of the tubercle bacillus, and probably the same thing holds true for the human body. Certainly in some cases he has found that the dietetic treatment of the diabetes has been followed by marked improvement in the pulmonary condition. With the re-establishment of carbohydrate tolerance, the patients gain in weight and improve in general health. Thorspecken asserts that the diabetic condition should be treated, not despite the complications of phthisis, but as a direct means of more successfully combating that complication. —*München. med. Wchnschr.*, 1907, February 12.

THE TREATMENT OF APPENDICITIS.

WITHIN recent years there is an unmistakable reaction against the indiscriminate operative treatment of appendicitis. The advocates of an expectant medical treatment are becoming more numerous. Garhammer is one of the recent writers, and his contribution is fairly typical of the modern view. He holds that an ordinary case should be treated with small doses of opium, local applications of ice, and a fluid diet consisting chiefly of milk. From this general statement are excluded those cases which show marked general involvement of the peritoneum, or where the presence of pus is shown by fluctuation or by an exploratory puncture. These cases are transferred immediately to the surgical side, and a similar course is pursued if the same conditions arise during the progress of a case. It is extremely important that each case be carefully watched, as alarming symptoms may arise during the development of a case which commenced in an apparently mild form. Similarly, cases which at the onset appear very grave frequently clear up very satisfactorily. In judging of the severity of a case, chief weight is laid upon the general condition rather than upon the local pain and discomfort. In this fashion 167 cases have been treated. Of these, eighteen were transferred to the surgeons for operation, and of them three died. All the other cases recovered, giving a mortality of only 1·8 per cent.—*München. med. Wchnschr.*, 1907, February 19.

SILVER SALTS IN GONORRHŒAL OPHTHALMIA.

DE SCHWEINITZ points out that most of the antiseptic lotions used in this condition must be looked upon chiefly as cleansing agents, since in the strengths in which they can be employed they are not bactericidal. This is true of boric acid and perchloride of mercury, but perhaps an exception may be made for potassium permanganate. The specific treatment consists still in the use of silver nitrate. He does not believe in the newer silver salts. Prolonged testing has shown him their inferiority to the older drug, which is efficacious if properly applied.

The conjunctival sac is thoroughly cleansed ; the lids are then everted, and by means of a cotton swab painted with a 2 per cent. solution till a white pellicle forms. Irrigation with normal saline is thereupon used, which neutralises the silver nitrate and removes the film. Protargol is not nearly so reliable as silver nitrate in the gonorrhœal conjunctivitis of adults, and is in every way inferior to it.

Argyrol, despite the strong clinical claims made for it, is really a very weak antiseptic. It is very bland and unirritating, and is useful for ophthalmia neonatorum, as it can do no harm, even in the hands of inexperienced persons. One further advantage it possesses is that it is highly diffusible, and penetrates into all the folds of the conjunctivæ, thus markedly facilitating the removal of pus.—*Therap. Gaz.*, Detroit, 1907, January.

SOME THERAPEUTIC EFFECTS OF THE ADMINISTRATION OF THE PITUITARY GLAND.

RENON and Delille have obtained interesting results from the administration of the dry pituitary gland in various conditions. The dose employed was, as a rule, 1½ grs. night and morning of the dried powdered gland. The general action is manifested upon the pulse, arterial tension, appetite, and sleep. The pulse rate is constantly slowed, and the pressure rises in all cases ; while the appetite returns, and the patients sleep better. The effect upon the body weight and character of the blood are so variable that no general statement can be made. These results agree with those of previous observers. The therapeutic effect was tested in exophthalmic goitre, pulmonary phthisis, typhoid fever, and in myocarditis. No observations were made on cases of acromegaly or giantism.

In the syndrome of Basedow's disease the effect was fairly constant. From the fourth or fifth day the sleeplessness, tremor, digestive disturbance, sweating, and unpleasant feeling of heat were markedly improved. Tachycardia diminished less rapidly, the pulse reaching its slowest rate about the fifteenth day, though sometimes an additional week's treatment is required. The arterial tension rises almost immediately, and attains its maximum about the second or third week, but after a certain period falls again, though maintaining always a higher plane than before treatment. The exophthalmos is not readily affected, while almost no diminution takes place in the goitre. The weight always increased by a few pounds. On stopping the drug the former symptoms of sleeplessness, tremor, and exophthalmos reappear in from five to eight days. In chronic pulmonary phthisis, the hypophysis medication reduces the heart rate and increases the arterial pressure. The appetite improves. Observations in cases of typhoid fever confirm these findings.—*Bull. gén. de thérap.*, Paris, 1907, February 8.

INSANITY.

UNDER THE CHARGE OF
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Stereotypism in Mental Disease.

An interesting study of stereotypism as a symptom in dementia præcox has been made by Dr. Dromard (*Arch. de neurol.*, Paris, 1905, March). This paper is the result of an investigation of seventy-five cases.

There are many varieties of stereotypism, but these may be grouped first of all under one or other of two main divisions, those which are akinetic, and those which are parakinetic. The first are manifested in fixed attitudes, which may be total (general) or partial (local). The second are in the form of fixed movements, which may show themselves in various ways—writing, speaking, mimicry, walking, or a complexity of acts. In both groups the phenomena are the reflection of a psychical state, and their mechanism is psychological rather than physiological. The above varieties are then further considered, and examples of each are given.

He then passes to the consideration of their evolution. Looked at from this point of view, the phenomena of stereotypism may again be divided into two categories, those seen during the active period of disease, and those found in the residual period. In other words, the former are the result of the hyperactivity of diseased higher centres, the latter of the uninhibited activity of lower centres. Pathologically, the former are the result of immediate lesions, the latter of consecutive lesions. To the former belong the attitudes and catatonic movements properly so called, which so often mark the commencement of the mental disease. To the latter belong by far the greater number of cases showing stereotypism. The active stage of the disease is shorter, and the number of cases exhibiting the former type is consequently fewer. In most cases the phenomena of stereotypism seen in the stage of dementia are the result of previous insane ideas, though in some the origin, so far as it can be traced, is fortuitous.

An answer is attempted to the question—Have the phenomena of stereotypism any clinical significance? Dr. Dromard considers that in dementia præcox they are of the greatest importance. He has investigated the question from three points of view. As to their average frequency, he found them in quite two-thirds of his seventy-five cases. As to their frequency in the various forms of that disease, he met them most often in the catatonic variety, and the form assumed was that of primary stereotypism. The hebephrenic and paranoiac varieties exhibited the symptoms less frequently, and in them the type was that of the secondary variety. Looked at from the point of view of the duration of the mental disease, his conclusion is that in the catatonic form stereotypism is most frequent in the early stages. In hebephrenic it appears much later, while in the paranoiac variety it may be regarded as almost exclusively confined to the final period.

The author considers it necessary to point out that not every repetitive act belongs to the category of stereotypisms. To do so it must be dissociated at the time of its performance from the idea which primarily brought it forth. Some acts are repeated as a result of hallucinations or of imperative ideas, but these are pseudo-stereotypisms. From the point of view of diagnostic significance, stereotypism is also important. It is, of course, not confined to dementia præcox. Stereotypism is characteristic of the excited stage of that disease, but not, as a rule, of the same stage in other mental diseases.

Its prognostic significance is decided. If it appears in the acute period of catatonia it is not necessarily a sign of ultimate failure to recover, but if it appears late in that disease and shows a gradual evolution, its import is grave.

The Psychoses of Acute Infectious Diseases.

Dr. Régis of Bordeaux has published (*Arch. de neurol.*, Paris, 1905, October) a résumé of a more extended work, which is shortly to appear, on the above subject. In the author's opinion the psychoses which occur in connection with these diseases not only resemble the toxic psychoses, but are in all respects identical with them. Mental symptoms may show themselves at any of four stages—during the incubation period, during the period of pyrexia, at defervescence, or during the course of convalescence. These may be simplified by regarding the first two as belonging to the period of acute infection, the last two to the terminal period. The symptoms in all are those of mental confusion, a characteristic of the toxic insanities. During the febrile stage the mental symptoms are usually more acute, taking the form of hallucinatory dreaming. The hallucinations are occasionally pleasant, but more often they are the reverse, even terrifying. It is accompanied by excitement and restlessness, and it is in this form that suicide most frequently occurs, generally without premeditation, and as a direct result of painful hallucinations. It is therefore most important that a patient should receive very careful attention at that time. During the post-febrile stage the mental symptoms are rather of the asthenic type of confusion, characterised by obnubilation, stupidity, or pseudo-dementia. Delirium and restlessness may or may not be present. Amnesia is a common feature, and in some cases may be very prominent. In others the symptoms are strongly characteristic of general paralysis. In their pathological anatomy the cerebral lesions in the psychoses considered are in effect those of general paralysis, which he regards as a diffuse meningo-encephalitis. They consist of œdema of the cerebrum, active vascularisation, various degrees of alteration of the nerve cells and fibres, and proliferation of the neuroglia. These changes are the result of the direct action of microbes on the nervous centres, of the action of the products secreted by the microbes, or toxins, or lastly, of secondary auto-intoxication due to affections of the internal organs, or to non-elimination of the poisons.

After a few remarks on diagnosis, prognosis, and treatment, Dr. Régis describes more in detail the mental symptoms which may be manifested in connection with attacks of influenza and pneumonia. As to the former, the symptoms are considered according to whether they occur during the fever or during convalescence. Mental confusion, acute hallucinatory mania, or a purely acute mania are the usual forms assumed in the first of these. The symptoms are generally most pronounced at night. As a rule, the symptoms, if acute, are not of long duration. The psychoses of the convalescent period may assume one of four forms, as Kraepelin has pointed out, the delirium of collapse, acute hallucinatory mania with stupor, asthenic delirium, or acute dementia. Particular attention is directed by the author to the frequency of cases in this category which resemble general paralysis in every particular. They are to be recognised by the rapid change which the symptoms undergo when they are carefully studied from day to day. They usually all recover well.

As to the psychoses of pneumonia, attention is specially directed to the possibility of mistaking them for those of acute alcoholism. The author thinks they are quite different. The symptoms are in the main the same as those of an acute hallucinatory mania, and only seldom do they take the form of stupor. In some the mental attack may be looked upon as a form of crisis. In that event the symptoms are those of an acute mental confusion, with multiple hallucinations and great restlessness. These symptoms add much gravity to the prognosis, but as a rule they are transitory.

The Bacteriology of Epilepsy.

An interesting critical review of the bacteriology of epilepsy is given by Bra (*Arch. de neurol.*, Paris, 1905, December). His own researches began in 1902 with the discovery of the presence in the blood of epileptics of a micrococcus to which he attributed a causal significance. Subsequent to this Besta made an elaborate investigation of 125 cases, and with an entirely negative result so far as this micrococcus was concerned. Lannois and Lesieur also had the same experience. Ghiliarowski was more fortunate, as, in five cases examined, he found a micro-organism corresponding to that of Bra. Subcutaneous inoculations of rabbits with pure cultures in small quantities were without result. Tirelli and Brossa, as a result of extensive research, also failed to corroborate Bra's work, except in two doubtful instances. In some others they observed granules in the blood, but they would not stain, and cultivation trials were unsuccessful. Entralgo, in the course of investigations with another object, observed micro-organisms in the blood of epileptics, which on staining were seen to be micrococci.

In replying to criticisms of his work by some of these observers, Bra directs his attention to three points—(1) The paucity of cases where examination of the blood has given positive results. This he tries to account for by stating that the micrococci are not numerous, and that several specimens of the same blood may have to be examined before they are found. (2) Resistance of the organism to staining. He states that it is not affected by methylene-blue, but stains readily with thionine. (3) Difficulty of obtaining cultures. This he thinks is due partly to the difficulty of getting rid of the fibrinous threads from the blood clot after it is mixed with the culture medium, and partly to the transparency of the growth of the organism, which makes it appear as if there was none, when careful examination would reveal that there was. But even granting the correctness of all his statements, Dr. Bra will have to adduce stronger evidence before it can be accepted as proved that the organism he describes is the *causa causans* of epilepsy.

The Anatomy and Pathology of Epilepsy.

Another view of the causation of epilepsy to that given above is put forward by Dr. John Turner (*Journ. Ment. Sc.*, London, 1907, January). In his view epilepsy is due to a combination of two causes, a condition of highly unstable equilibrium of the nerve cells, and a blood state capable of acting as an exciter of convulsions. The former is, of course, not a new suggestion, and the latter is consequently the one to which most of his investigation has been directed. Forty-one cases were most carefully examined microscopically, and in 90 per cent. of these clots were found in one or more of the cerebral vessels. The blood plates were also found to be present in excessively large numbers, and were probably the cause of the marked tendency to the formation of thrombi. Investigations were also undertaken to test the coagulability of the blood in epileptics. The method employed is not quite reliable, and the results are not very concordant, but on the whole there appears in the figures given to be a general relation of increased coagulability to the occurrence of fits. The paper bears evidence of much careful and arduous work, but its conclusions do not yet appear to have the stamp of finality upon them.

DERMATOLOGY.

UNDER THE CHARGE OF

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The Röntgen Rays in the Treatment of Lupus.

Hall-Edwards, one of the earliest operators with the X-rays, and who has himself suffered severely from exposures before the dangers were realised, makes an interesting contribution from his experience (*Arch. Röntg. Ray*, London, 1907, January). The property of these emanations consists in their power of retarding the multiplication of tubercle bacilli in the tissues, and in some instances, of enabling the leucocytes to digest them. While acknowledging the benefits derived from their use, he says, that in no given disease can we devise a "royal road," for the simple reason that individualism, idiosyncrasy, temperament, and environment are factors which cannot be efficiently dealt with by physical, chemical, or other means within our command. Cases are not quite identical. In some instances of lupus planus, which have failed to respond to full doses of X-rays, irritation of the surface by caustics, pyrogallic acid, or blistering, has produced rapid improvement on renewing exposures. As to their mode of action, while they cause a partial atrophy of the more highly differentiated elements, their chief effect is due to vascular disturbance. Their long-continued interworking brings about changes in the cutaneous nerves. He is disposed to think, though not yet at all certain, that if the opsonic index is raised by the injection of minute doses of tuberculin, the subsequent irradiations are more effective, whether the result is more lasting remains to be seen, since total disappearance of the lesions may be followed by recurrence. We cannot yet regard the cure as permanent in all cases. He prefers masks or screens to the part rather than shields to the tubes. Extensive cases often do better than more limited ones. Lupus of the mucous membrane is less benefited than that of the skin, but he has seen good results follow from spraying with a solution of adrenalin chloride before exposure.

A Valuable Aid to Diagnosis.

There are certain superficial lesions of the skin and of the mucous surfaces which are rather hard to recognise. Such are slight deficiencies, abrasions, or ulcerations. Should these be situated on a moist region, at the bottom of a fold in the skin or the mucous membrane, as for instance on the vulva or on the uncovered portion of the glans penis, there is apt to be some coexistent catarrh, which masks the initial characters of the lesion. The uncertainty is more serious where it is important to arrive at a precise diagnosis in the interests both of the patients themselves and of those who come in contact with them. Julien (*Journ. mal. cutan. et syph.*, Paris, 1906, June) has discovered that a solution of chromic acid of 1 in 50 in distilled water possesses special diagnostic properties. This, which is of a clear yellow hue, is neither caustic nor does it alter the texture of the tissues with which it comes in contact. It has the property of adhering closely to tissues which have been denuded of their epithelial investment. If a pledget of cotton-wool is moistened with this solution, and passed over a suspicious area, normal portions escape coloration, but a yellow tint is immediately imparted to any which are raw or denuded. We can therefore say that such and such a tissue *takes* or does *not take* the chrome, in the same way as in bacteriology we distinguish particular microbes according to their affinity or non-affinity for Gram's stain. Syphilitic mucous patches may be so minute as to be indiscernible by mere inspection, their presence is at once revealed by this method. In the buccal cavity an opaline plaque is observed, by the application of the chrome solution, the most tiny erosion, the existence of herpetic vesiculation, or the shape of a fissure, can be instantly displayed. Ulcerative processes occurring in an intertrigo of the groin are rendered visible. The effect of nitrate of silver is intensified if applied over the chrome solution.

Dermatitis Vegetans.

Attention has recently been directed to this disease, first accurately described by Hallopeau, from various sides. Gaucher (*Gaz. d. hôp.*, Paris, 1906, December 6), Fordyce and Gottheil and also Pusey

(*Journ. Cutan. Dis., incl. Syph.*, N.Y., 1906, December) have all articles on it. According to the first writer named, it is a pyodermatitis, constituted by the occurrence of miliary pustules, which develop excentrically, and thus produce circular or poly-cyclic, very itchy patches. The pustules become vegetating, or at least the subjacent dermahypertrophies, giving rise to a sort of papular elevation at the site of each pustule. In the centre of the patches, the pustules heal, and leave a pigmentary macule, which fades slowly, but other pustules constantly appear at the periphery, due to successive auto-inoculations. The lesions may thus invade a large part of the cutaneous surface, but have localities of election, which are—the inguinal, genito-crural, and genito-anal regions, at the pubes and round the umbilicus, the axillæ, face, and fingers. But accidental auto-inoculations may give rise to similar pustules anywhere. The scalp may be attacked, and the vegetative hypertrophy succeeding the pustular eruption takes here a strange aspect, reminding one of the cerebral convolutions. The suppurative lesions may appear on the buccal mucosa, where they are specially rebellious. In Fordyce and Gottheil's case the eruption consisted of vesicles or bullæ rather than of pustules, the course followed being exactly like that observed in burns of the second degree. In the two instances seen by Pusey, the earliest stage was one corresponding to acute vesicular eczema, with free suppuration and abundant crusting. The vegetations were exuberant masses of soft red tissue, piled up into cauliflower-like excrescences, partly denuded of epidermis and exuding pus abundantly, in fact not unlike the plateaux of kerion. Microscopically, the structure is that of a loose and highly vascular granulation tissue. All the authors regard the process as not a primary one, but the result of secondary infection, "with the consequent production of exuberant growth of both the connective tissue and the overlying epidermis." In all instances staphylococci were found, and chiefly the *Staphylococcus aureus*. The *Bacillus coli* has likewise been met with. A local antiseptic treatment is all that is indicated, since the general health is not necessarily implicated.

The Theory of Angioneuroses and Hæmatogenous Inflammation of the Skin.

Török (*Wien. klin. Wchnschr.*, 1906, December 20) has raised the question whether the view propounded some forty years ago by Landois and Eulenburg is still tenable, that exudative processes in the skin arise under the influence of the vasomotor nerve centre. To the class of disorders believed to be due to this perverted action were many drug eruptions, numerous rashes appearing in the course of infectious, septic diseases, and also some of undiscovered causation, as varieties of erythema, some bullous eruptions, prurigo and urticaria. Of late, Kreibich, Phillipson, and Török have come to the opinion that the pathologic factor reaches the blood vessels by way of the blood stream, and that the alterations in the skin are produced by its direct action on the vessel walls. It is therefore a reactive vascular disturbance of hæmatogenous origin. Török confines his observations exclusively to exudative processes, and rejects such cutaneous necroses as are met with in zoster, or are encountered in hysterical females. Experiments on animals negative the idea that inflammation can originate from angioneurosis. In hysterical women most of the exudative cutaneous phenomena are self-inflicted. In support of the angioneurotic theory, some authors have suggested that in certain persons there is an intense degree of sensitiveness on the part of the cutaneous vessels to special noxious bodies, and this may apply either to the central or peripheral vascular nerves. This, however, is a purely arbitrary assumption. Similar relations exist in so-called artificial cutaneous inflammations, such as individual susceptibility to iodoform or to arnica, yet these are not regarded as angioneuroses. Urticaria in association with intestinal worms has been looked on as angioneurotic, but it has been proved that these parasites secrete toxic substances, which being absorbed enter the blood stream. It is surprising how weak is the basis for a theory so long prevalent, whose supporters have never adduced proof from experiments on animals in confirmation of it. It has recently been demonstrated that the anatomo-pathological changes in erythema are simply inflammatory, and micro-organisms have been isolated in other identical lesions. Thus in the roseola of typhoid the characteristic bacillus has been traced, and in cutaneous inflammations connected with gonorrhœa, the gonococcus. In the exanthem caused by antipyrin the drug has been recovered from the vesicles, and Apolant has succeeded in evoking the same rash by its local application in those who manifest a predisposition. Therefore toxic erythemata should be regarded as inflammations of hæmatogenous origin. Phillipson has proved that wheals appear on the skin of dogs into whose cutis morphia, atropine, peptone, or paraphenilendiamin have been introduced after section of the sympathetic in the neck, or removal of the abdominal nerve trunks. Hari and Török found that a long list of substances possess the power of exciting urticarial œdema should they gain access to the corium, and consider that this is due to their direct action on the cutaneous blood vessels apart from participation of the vasomotor nerve centres. An objection that increased irritation does not transform the wheal into a typical inflammation, is disproved by the circumstance that paraphenilendiamin is capable not only of evoking wheals but also acute inflammation of the skin. In dermographism the irritability of the vessels is so intensified that slight mechanical traumatisms give rise to serous exudations, a further stage of which is epidermolysis bullosa. In so-called psychical urticaria, attributed to mental excitation, one must be careful to exclude all possibility of other and simpler explanations. Jadassohn admits the inflammatory nature of the erythemata, yet regards urticaria as an angioneurosis. As these are often met with in combination, the conclusion is more rational that their pathogeny is identical. Török believes that his statements uphold the contention that no positive fact has been adduced in support of the theory of angioneurotic origin of inflammation, but the contrary. "It can easily be seen, that if the idea of angioneurotic inflammation be abandoned, and replaced by the theory of hæmatogenous inflammation, not only does it open up new aspects of diagnosis and treatment, but it points out new paths of etiological research."

DISEASES OF CHILDREN.

UNDER THE CHARGE OF

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GASTRIC ULCER IN CHILDREN.

IN *Am. Journ. Med. Sc.*, Phila., 1907, January, Adler reports a case of gastric ulcer, and subsequently gives an interesting résumé regarding this condition in childhood. A study of post-mortem statistics shows that ulcer in children is absolutely and relatively of uncommon occurrence as compared with its incidence in adults. Thus, in Welch's collection of 607 cases of gastric ulcer, but one occurred in a child less than 10 years of age; while Lebert found only one case in his series of 226 cases. An examination of the statistics of children's hospitals shows a somewhat different result. Dusser found nine cases of ulcer of the stomach, and four cases of ulcer of the duodenum. In 390 autopsies at the Baby's Hospital, New York, Martha Wollenstein found five cases of gastric ulcer. Holt reports three cases accompanying follicular gastritis, and five accompanying general tuberculosis. From these statistics, it appears to occur oftener than is recognised clinically. The following four varieties of gastric ulcer are recognised in children:—1, Hæmorrhagic erosions; 2, follicular ulceration; 3, tuberculous ulcers; 4, simple ulcers. (1) Hæmorrhagic erosions are frequently noticed in children. They occur as the result of congestion of the vessels of the mucosa secondary to heart disease, pulmonary trouble, or more rarely in cirrhosis of the liver. They are also sometimes seen in purpura, hæmophilia, scurvy, leukæmia, and jaundice. The hæmorrhages vary from minute points, barely visible to the naked eye, to irregular oval or linear areas. This variety is of pathological rather than of clinical interest. (2) Follicular ulcerations occur in infants as the result of follicular gastritis. Here and there small spherical masses, about the size of a pin's head, are observed in the mucous membrane, due to inflammation of the solitary lymph glands situated in the wall of the stomach, and it is from necrosis of these structures that the ulcer is produced. The disease seldom extends deeper than the submucous coat, though occasionally the muscular and the serous coat are involved. These ulcers resemble those found in the intestine in cases of follicular enteritis. (3) Tuberculous ulcers are apparently less rare in children than in adults. Steiner met with four cases in 302 autopsies on tuberculous children, Widerhofer noted it twice in 418 cases, while Holt reports five cases in 119 autopsies on tuberculous children. (4) True peptic ulcer in children is either acute or chronic. Morphologically they do not differ essentially from the same condition in the adult. They are not always round, and they vary in size from a hemp-seed to a lentil. Their pathogenesis is as little definitely understood as in adults. Kundrat considers them to be the result of hæmorrhagic effusions in the mucosa, destroying its vitality and permitting auto-infection by the gastric juice. It is difficult to explain the existence of ulcers during the first few days of life on any basis other than that during parturition a hæmorrhage occurred into the mucous membrane. An infectious origin is indicated in children by the occurrence of gastric ulcer in cases dying of tuberculosis, typhoid, noma, diphtheria, and empyema. Ewald looks upon bacteria as causal in a mechanical rather than in a toxic manner. One acute case was evidently of traumatic origin, following severe burns of the arms and legs. Site of ulceration.—With the addition of several recent cases to Cutler's statistics, acute ulcers are found as often at the cardiac end of the stomach as at the pylorus. They were midway between the two openings in two cases, and generally distributed in two. In chronic ulcer there seems to be no special predilection of site.

Symptoms.—In infants, gastric symptoms, as a rule, are absent, indefinite, or masked by those of an infectious nature, a sudden hæmorrhage or pain from perforation being the first evidence of the presence of an ulcer. In a number of cases the ulceration was an unexpected finding at the autopsy. In older children the symptoms are similar, but milder than in adults. Pain and tenderness were noted in but 13 per cent. of the acute cases, but were present in 60 per cent. of the chronic cases. Pain was usually not severe, and was localised in the epigastrium. In all cases it came on in paroxysms occasionally before, but more usually after, food. In the acute cases in infants, vomiting was usually subsequent to diarrhœa. In cases accompanying follicular gastritis, vomiting was usually persistent. Fenwick mentions the finding of small pieces of mucous membrane in the vomit in cases of gastric erosions. Hæmatemesis was noted in 40 per cent. of the recorded cases. In four acute cases it was the cause of death, and the stomachs were found filled with blood. Symptoms of indigestion, anorexia, distension, nausea, or heartburn were rarely complained of. Diarrhœa was a prominent symptom, being present in one-half of the cases. Melæna was noted in the majority of the cases of hæmatemesis. In no case did it completely replace hæmatemesis. Fever, the temperature running up sometimes as high as 106° F., was noted in a considerable number of cases. A striking feature of acute gastric ulcer in children is the large percentage of perforations. In eighteen cases in which autopsies were made, perforation was found in six, or 33 per cent. The symptoms are sharp, sudden pain in the abdomen, vomiting, and collapse, death occurring within thirty-six hours. This complication is not infrequently the first indication of ulcer. In one case perforation of the diaphragm occurred, with subsequent pyopneumothorax. In Chvostek's case stenosis of the pylorus and dilatation of the stomach is recorded. The base of an ulcer had formed adhesions with the pancreas and contracted, narrowing the pylorus so that it could hardly admit the tip of the little finger.

Diagnosis.—In infants, in which the first symptoms are profuse hæmorrhage or collapse from perforation, early recognition is obviously impossible. In older children the symptoms are usually so little distinctive, and the conditions so uncommon, that the diagnosis largely depends upon the finding of blood in the vomit or stools; but care must be taken to eliminate the many other causes of hæmatemesis or melæna.

Thus, in Dusser's twenty-four cases of haematemesis from the stomach and bowels, in only thirteen was an ulcer found.

EPIDEMIC CEREBRO-SPINAL MENINGITIS.

Westenhoeffer (*Berl. klin. Wchnschr.*, 1906, October) gives an interesting account of the present state of our knowledge on epidemic cerebro-spinal meningitis, and offers suggestions regarding the treatment of this disease. Any doubt as to the epidemic nature of the disease was finally put at rest by an outbreak in Upper Silesia in 1905, when 3102 cases occurred. In this epidemic it was proved that the disease was essentially one of childhood, as 90 per cent. of those attacked were under 15 years of age. 1789 of the cases died, being a mortality of about 60 per cent.

The predisposition to the disease seems to depend largely upon the condition of the tonsils, the larger the tonsil the greater seeming to be the risk of infection. Owing to the difficulty of distinguishing between epidemic cerebro-spinal and simple basic meningitis, the determination of the etiology is not an easy matter. In the Silesian epidemic it was found that the meningococcus was the most frequent micro-organism found in epidemic cerebro-spinal meningitis, but that a mixed infection frequently occurred, the most common mixed infection being the diplococcus crassus. Thus it could not be absolutely determined that the meningococcus was the actual determining cause. The author found in every case of acute infection that inflammatory conditions of the fauces, especially of the tonsils, were present. The inflammation generally spread from the fauces to the posterior nares, to the pharyngeal walls, and to the cavities of the nose. When the discharge from these situations was examined, it was found that the meningococcus and the diplococcus crassus were present in pure or mixed culture, frequently corresponding with those found in the spinal fluid. The epidemiology is surrounded by much uncertainty, but the probability is that the respired air is the source of the infection. How the infection reaches the meninges is still a matter of speculation, but it has been definitely determined that direct infection through the ethmoid cells does not take place, the probability being that it is by means of lymphatic infection. The indications for treatment are threefold—(1) To attack the infection, (2) to remove the pus from the meninges, and (3) to prevent or cure the hydrocephalus.

Many drugs and means of treatment have been tried, but not a single method has been successful in curing the disease. As a rule, baths and lumbar puncture have been employed without giving any encouragement. The author suggests incision and permanent drainage through the atlanto-occipital ligament. By this means the cranial cavity and the subarachnoid space are opened into in such a way that the third and fourth ventricles can be drained through the foramen of Magendie. Of the four cases subjected to this treatment, one recovered and the other three died.

REPORTS OF THE MEDICAL SOCIETIES.

Edinburgh Medico-Chirurgical Society.—*Wednesday, March* 6, 1907.—Dr. J. O. Affleck, the President, read a paper entitled "Clinical Observations and Experiences in the Prognosis and Treatment of Lobar Pneumonia." He was of opinion that there is a tendency to the increase of the disease. During the past sixteen years it had become a more serious disorder than it was before, and this is partly accounted for by influenza, which appeared in this country in 1890, and which is frequently followed by pneumonia. Few diseases are more treacherous in deviating from the normal to an abnormal course, and there is no means of telling at the commencement how a case may end. Among the general points in prognosis, we have, firstly, the age of the patient (the mortality in patients over 60 is 50 per cent., irrespective of previous health); secondly, the habits, particularly the alcoholic, may outweigh the advantage of youth, and precipitate a fatal result; thirdly, previous or existing disease, such as nephritis, endocarditis, etc., affects the result. The pneumonia following surgical operations, though grave, is not always fatal. In the insane, especially in the acutely insane, pneumonia is very serious. Reference was next made to prognostic indications derived from the incidence of the attack. In some cases the patient is overwhelmed by the toxæmia from the first, and dies very soon, treatment having no chance. Cases exhibiting prominent gastric and abdominal symptoms often turn out severe, and such cases are sometimes mistaken for appendicitis. The pain is probably due to disturbance of the vagus nerve. Perspiration, indicating vasomotor paresis and profound asthenia, is a serious symptom; so also is delirium. During the course of the disease, insomnia is a symptom of evil prognosis; so also is a very high temperature. The main factor in determining prognosis, however, is the condition of the heart. A pulse rate of 120 is serious, 130 dangerous, and of 140 very grave; cases of recovery after even a higher pulse rate than 140 have, however, been recorded. A good pulse may very quickly go wrong, and sudden heart failure, similar to that occurring in diphtheria, may occur. The crisis is an anxious time, and in a favourable case the temperature, pulse rate, and respiration should fall together; any departure from this is unfavourable. Referring to treatment, Dr. Affleck advocated less feeding, less medication, and less stimulation. There is little power of arresting the progress of this self-limited disease. The best line of treatment is to watch for symptoms calling for special treatment. For the pain, when severe, ice-bags are very useful; if these are not well borne, poultices should be substituted. For dyspnœa, he finds aromatic spirits of ammonia and compound spirit of ether most useful. For insomnia, paraldehyde and chloral and digitalis combined; sulphonal, trional, and veronal are not so useful. He had tried oxygen inhalation, but had been disappointed with it. It is a good thing to give strychnine early and throughout the course of the attack, to combat any tendency to heart failure.—Drs. J. S. Stewart and Peel Ritchie read a paper "On the Use of the Opsonic Index in the Diagnosis of Tuberculosis." The paper was based on the examination of surgical tubercle in out-patients. A number of control observations in non-tuberculous cases were also made. To obtain reliable information, several observations of the opsonic index are necessary. T.R. is given in dose of $\frac{1}{1000}$ mgrm.; the index is observed before and after administration. It is found that in normal individuals the index rises quickly; in tuberculous cases, injection is followed by a negative phase, and this by a rise, but not to such a high point as in the normal individual. The authors had found this test of service in diagnosis and in prognosis.

Edinburgh Obstetrical Society.—*Wednesday, March* 13, 1907.—Dr. J. W. Ballantyne, President, in the chair.—Mr. Brewis and Dr. Haig Ferguson showed specimens.—Sir Halliday Croom read a paper on "Exophthalmic Goitre in its relation to Gynæcology and Obstetrics," which will appear in our columns.

Glasgow Medico-Chirurgical Society.—*March* 1.—Dr. J. Lindsay Steven, President, in the chair.—Dr. Rowan showed two cases of gumma of the iris, in one of which there was distinct history of the infection, while in the other there was evidence of secondary manifestations.—Dr. Walker Downie read notes on six cases of sarcoma of the nose. The ages of the patients varied from 11 to 67 years, and both sexes were included in the series. Histologically, the tumours were found to be round-celled, spindle-celled, or myo-sarcomata. They usually sprang from the lateral mass of the ethmoid or a turbinal bone, and might extend into the antrum or to the cribriform plate.—Dr. David Newman described a method of draining the kidney without the use of dressings. A rubber tube passed from the pelvis of the kidney to a bottle placed in the patient's pocket or below the bed. The tube was kept in position by means of a metal flange, which was fastened to the skin by means of adhesive plaster. He described—(*a*) Cases of sacculated bladder, in two of which the diverticulum contained a calculus; (*b*) a case of extensive ballooning of the mucous membrane of the bladder, due to obstruction to the mouth of the ureter; (*c*) three cases illustrating causes of painful micturition in women.

Glasgow Medico-Chirurgical Society.—*Friday, March* 15, 1907.—Dr. J. Lindsay Steven, President, in the chair.—Dr. Walker Downie showed—(*a*) A patient who had been operated on for sarcoma of the nose, in whom there had been great nasal deformity, with widening of the nares; (*b*) a patient with a large mucous polypus springing from the upper part of the gullet and overhanging the arytenoid cartilages.—Dr. A. A. Young showed three patients, one of whom had been operated on for duodenal perforation, and two for gastric perforation, and also read notes on a number of similar cases.—Mr. Maylard discussed the question of gastro-jejunostomy in the treatment of these conditions either at the time of the primary operation or at a later date, and mentioned the frequency of hiccough in cases of duodenal perforation.—Dr. Alex. M'Lennan read a paper on "The Treatment of Microbic Invasions by Bier's Hyperæmia," and demonstrated the method of using the apparatus in various conditions.—Dr. G. H. Edington showed the following card specimens:—(1) Strangulated ovarian cyst; (2) multilocular ovarian cyst; (3) composite ovarian tumour, consisting of one adeno-cystoma and two dermoids; (4) hæmatosalpinx.

GLASGOW PATHOLOGICAL AND CLINICAL SOCIETY.—*March* 11, 1907.—Dr. J. **LINDSAY STEVEN**, the President, in the chair.—Professors **STOCKMAN** and **MUIR** described a case of lymphadenoma, with involvement of liver and spleen, and specimens from the case were exhibited. The patient was a boy, æt. 14. Seven years ago enlarged glands were removed from the left side of the neck in the Glasgow Royal Infirmary. Further enlargement took place on the same side two years later, but disappeared under treatment in the Edinburgh Royal Infirmary. At the end of September 1906 the abdomen became very prominent, and a large hard swelling appeared on the left side, and somewhat later cough and night sweats became troublesome. On admission to the Western Infirmary in December 1906, extreme emaciation, profound anæmia, and a general enlargement of the lymphatic glands were noted. The spleen and liver also showed enlargement. Death took place on the 22nd January 1907. The autopsy showed a general glandular enlargement. The spleen weighed nearly 2 lb., and distributed through it were pale lymphoid areas, mostly of small size, but very numerous. The liver was also much altered by diffuse infiltration, and a similar condition was present in the lungs. The bone marrow showed a slight hyperplasia. The microscopic appearances of the lymphatic glands showed a proliferation of the endothelial cells and of the connective tissue cells, with disappearance of the lymphoid cells from the older foci, and ultimate sclerosis.

CARD SPECIMENS.—Dr. **RUTHERFORD** showed a photograph of a fractured clavicle, with unusual displacement; also a skiagram of the clavicle, illustrating a fallacy.—Dr. **TAYLOR** showed for Dr. **DALZIEL** (*a*) a large sarcoma of the femur, and (*b*) multiple chondromata of the fingers; for Dr. **RENTON** (*c*) a myeloid sarcoma of the head of the tibia from a man, æt. 67, with photograph.

FORFARSHIRE MEDICAL ASSOCIATION.—*March* 7, 1907.—Mr. **GREIG**, Vice-President, in the chair.—Dr. R. C. **BUIST** showed a case of congenital absence of the radius. The infant, a few weeks old, was born with the right hand clubbed, and had no thumb; an X-ray photograph showed the radius to be completely absent. There was also facial paralysis on right side, and several pre-auricular tubercles were seen on both sides. Pregnancy was normal.—Mr. **GREIG** showed X-ray photos. from a child with both hands clubbed. The radius was completely absent on the left side, and partially on the right.—Dr. G. **PIRIE** exhibited a series of X-ray photographs.—Mr. **GREIG** exhibited and explained Greville Anderson's screws and clamps for the more perfect securing of the ends of ununited fractures in long bones.—Professor **STALKER** read a note "On Pulsus Bisferiens." The case was one of aortic stenosis, and a striking clinical feature was the diastolic murmur, which was long, rasping, and squeaking in character. The tracing of the pulse in his case showed a split wave, but it was not due to any defect of the instrument, for a double impact could be most distinctly felt by the finger in both radial pulses.—Dr. R. C. **BUIST** read a practical note "On the Application of Midwifery Forceps."—Dr. **FOGGIE** then read a paper on three cases of cerebro-spinal meningitis.

EDINBURGH MEDICAL JOURNAL.

EDITORIAL.

Lord Lister.

Few celebrations within recent years have aroused such universal and unanimous feelings of respect and admiration for a man as that which took place on 5th April on the occasion of Lord Lister's eightieth birthday.

Congratulatory addresses came from all quarters of the globe, each and all bearing tribute to the master whose epoch-making researches have conferred an inestimable benefit on mankind for all time.

To Britons it will ever be a source of pride that he is one of her most illustrious sons, and to Scotsmen, more especially, the fact that the foundations of his world-wide fame were laid in Edinburgh and Glasgow must always serve as a stimulus to succeeding generations of students, and shed lustre over the universities which were privileged to claim his services.

It was as a young surgeon in the Edinburgh Royal Infirmary that those researches which have revolutionised surgery were first begun, and which were continued with ever-increasing zest and success during succeeding years, first in the Chair of Clinical Surgery of Glasgow, and, from 1869 to 1877, as Regius Professor of Clinical Surgery in the University of Edinburgh. Though London claimed him, and there, we rejoice to think, he enjoyed happiness and every honour which it has been in the power of his profession to bestow, yet it is only in a restricted sense that Lord Lister can be said to belong to one people or any country. He belongs to humanity as a whole, and afterwards will be enshrined by posterity amongst that band of men to whom the world owes an unredeemable debt.

It is a matter of deep regret that Lord Lister's state of health did not permit of his taking an active part in the celebration of his birthday, but we are glad that he was able to receive a deputation from the Royal College of Surgeons of England, and personally to give his consent to the commemoration of the event by the publication in book form of his various scientific papers. An editorial committee has been formed for this purpose, and we look forward to the appearance of a work which will be worthy of the name it will bear, and prove a lasting record of a life devoted with extraordinary singleness of purpose to the discovery of truth and alleviation of suffering.

Irish University Legislation.

The presentation to the Chief Secretary of two Scottish memorials against the proposed legislation for the Irish Universities, as foreshadowed by Mr. Bryce and apparently adopted by Mr. Birrell, must be regarded as profoundly significant. The joint memorial of the four Scots Universities was adopted with almost universal acceptance by principals, professors, and lecturers, very few of the administrative and educational staffs of the Universities, amounting to more than two hundred in number, having failed to sign the document. The memorial from the lecturers of the Edinburgh School of Medicine was endorsed with even greater unanimity, as only one of the fifty lecturers declined to add his name to it. Never before in the history of the Scottish Universities has opinion been so entirely of one mind on any question. Men of the most widely separated beliefs, ecclesiastical and political, have united in objecting to proposals which their experience teaches them to recognise as fraught with disaster.

Their opposition to the threatened legislation is not surprising. It would be strange indeed if they did not express their views on a subject which is of such momentous import. To desert those who have mainly kept the lamp of literature and science burning in Ireland would be a dereliction of duty as disgraceful as cowardly. Put shortly, the scheme adumbrated by Mr. Bryce proposes to cancel the charters of the University of Dublin; to dissolve the Royal University of Ireland; to erect a new Irish University; to place under its control Trinity College, a College to be founded for members of the Church of Rome in Dublin, certain of the present Queen's Colleges; and to affiliate some of the theological training colleges. Everyone knows what the result of such a scheme must inevitably be, if it should unfortunately be carried into effect. With the proportions of Catholics and Protestants as they stand in Ireland, a generation would suffice to see the Protestant Colleges reduced to the position of a mere appanage of Rome, and Trinity College would be under the heel of Maynooth.

Believing unreservedly that no part of the education provided by the State, whether in school, college, or university, should be connected with any particular Church, and hoping earnestly to see the day when all University chairs devoted to theology will deal with religions and creeds from a philosophic and historical, instead of a dogmatic and sectarian point of view, we deeply regret that it should seem necessary in this age to endow any educational institution on the basis of a Church system. Dogmatic theology has no place in modern science. We cannot fail, however, to recognise, although we sincerely deplore, the fact that if an overwhelming proportion of the inhabitants of any division of the kingdom demands an educational institution founded on sectarian lines, it cannot be denied without injustice. Such an institution, nevertheless, should from every point of view be a separate University. The grouping of affiliated colleges under one University has not in our own days proved even so stable as the "union of hearts" in the dual monarchy of Scandinavia, so often held up to admiration by a certain school of politicians. Granted that the present state of the Irish Universities fails to satisfy the wishes of the majority of the Irish people, the only course open is to erect a new University for the Roman Catholics, and at the same time to confer a charter upon Queen's College, Belfast, giving the status and powers of a separate University, so as to provide for the Presbyterians and other Protestant sects.

Here we reach the crux of the situation. It has been frankly admitted that the present Government, although quite willing to grant a separate Catholic University to Ireland, dare not propose such a course, as the Nonconformist Conscience would at once rebel. The Nonconformist Conscience, however, seems quite satisfied to endow a Catholic University which will have the power of crushing an Anglican College. Nothing so base as this has ever been proposed in the whole history of University education in these islands, and it must fill every liberal mind with "noble rage." The mask has often been stripped from the face of the Nonconformist Conscience in the past, but it may be doubted if anything has ever revealed its cynical hypocrisy like this. And yet, dispassionately considered, it is after all only what might be expected. The Nonconformist Conscience is an inheritance from John Calvin. As is well known, John Calvin induced the Church of Rome to deal with the enlightened Michael Servetus, and was therefore directly responsible for his martyrdom. The possessors of that narrow and dreary heritage are now invited to follow in the footsteps of their forerunner, and to hand over to Rome those enemies whom they abhor. The proposals, therefore, of Mr. Bryce, endorsed as we are led to believe by Mr. Birrell, contain the bribe to the Nonconformists that by means of the scheme suggested they may at once satisfy the Catholics and injure the Anglicans. Were the Catholic clergy of Ireland like the men whom we know and love in the old Roman communities of the Highlands, we would not feel the proposed legislation to be so laden with fateful issues, but knowing only too well the type of man reared in Maynooth on the Breviary and the Lives of the Saints, we are aghast at the prospect.

It will be strange indeed if the author of "Obiter Dicta" should be the man destined to destroy the institution to which Ireland in the last three centuries has owed almost all of her literary and scientific triumphs, and through which she has made the world her debtor for many advances in research and learning. We cannot regard Mr. Birrell in his present position with anything like confidence. During the early days of the parliamentary discussions on last year's Education Bill, we had hopes that he would have shown strength enough to carry out a satisfactory compromise between antagonistic views and conflicting interests.

It remains to be seen whether in the proposals of the Government, when they have taken definite shape, he is capable of making a firmer stand on the principles of justice than he did in respect of the unregretted Education Bill. If he proves unable or unwilling to listen to the dictates of moderation and wisdom, it will be necessary to summon the whole forces of progress to defeat a project which would relegate Ireland to the darkness of the Middle Ages.

The Cumnock Murder.

FOR many reasons, what is known as the Cumnock Shortbread Poisoning Case will rank as one of the criminal *causes célèbres* of Scotland, which has provided a good many such during the past fifty years, and brought into world-wide fame jurists such as Deas, Inglis, Moncreiff, and as medical jurists the names of Christison, Maclagan, Littlejohn, and others.

Briefly stated, Mr. Brown of Cumnock was accused of sending as a gift shortbread, the iceing of which was crudely saturated with strychnine (a most bitter substance), by the partaking of which one woman lost her life, and the lives of three others were placed in jeopardy. Whatever the object of the sender, it was clearly the work of an ill-balanced, disordered brain, for he did not, and probably could not, realise the widespread and deadly havoc which might have resulted before the victim he wished to strike at was put out of existence. To pay one out for a real or alleged wrong, or for benefit, or to execute vengeance in this way, is not the method which a person of sound mind would be likely to choose. It is inconceivable.

The case rises superior to the usual sordid murder trials, from which our Courts of Justice are unfortunately never free, and thus a public and professional interest has been aroused, and leader-writers, alienists, and medical experts have entered the arena of public controversy. As might be anticipated, there is the usual conflict both of medical and public opinion to suggest that the art of forensic psychiatry is as illimitable as it is varied. This diversity of opinion may not be a bad thing, for out of it will ultimately emerge truth and right, as it certainly did in this case.

The criminal procedure adopted, said to be unusual, and the verdict, have been called in question by some, by others (the majority) approved. What is the law on the matter? Briefly put, it amounts to this: if a person, either of presumably sound or of unsound mind—the state of mind at the start is immaterial—commits, say, a crime of violence or a crime against chastity, the criminal authorities arrest him, and one of two courses is followed. The first, that most frequently pursued, is to retain him in custody, and serve upon him an indictment. This was done in this case, and the Crown were from the very first aware of accused's epilepsy and his eccentricities. When responsibility is in the scales of justice, epilepsy *per se* is bound to be a grave element in the case. In due course he is brought to trial, and evidence led to prove the crime. Two special defences may be set up: "insane at the time of committal," or "insanity (now) in bar of trial." Neither special defence need necessarily prevent the unfolding of the crime by evidence, and under Scottish criminal jurisprudence, if either of the special defences referred to be established on evidence, no verdict of guilt is returned, even although that is evident, but the sentence of the Court is that accused be detained during His Majesty's pleasure. As a rule, the Crown with all the resources at its back attempts to rebut by the highest medical opinion, and strongly contests either special defence, and seldom or never set it up themselves, although they have the same right to do so as the defence.

When the question of insanity arises, there should be less desire to convict, and more to arrive at the truth. In short, it should be the object of both sides to bring out the truth, especially where insanity, a probable element in the case, is concerned. This observation may savour of a counsel of perfection, having regard to the variety of opinions which can be got, but between the judge, counsel, and the jury, a wholesome sifting takes place.

The second or alternative course open to the prosecuting authority is where insanity is patent, or reasonably suspected, to proceed under sec. 15 of the Lunacy Act of 1864, referable to dangerous lunatics or persons threatening danger to the lieges. Under the latter description, the alleged author of the Cumnock tragedy, an epileptic of the potentially dangerous kind, even if not maniacal or homicidal, would come. The Sheriff could, on being satisfied by all the evidence, and especially by the evidence of two medical men in open court in the presence of the accused, who can and sometimes does cross-examine the doctors himself, send him to an ordinary District Asylum under safeguards, or to the custody of his friends under safeguards satisfactory to the committing authority.

Adverse critics of the verdict and procedure adopted in this case say that sec. 87 of the Lunacy Act of 1857 was not meant for such cases. This is begging the whole question. Most people will say it was intended and eminently fitted for such a case. The framer of the Lunacy Act of 1857 was, if the writer is not mistaken, that eminent criminal lawyer, Lord Advocate James Moncreiff. Although half a century old, there is no evidence of slipshod or shoddy work in its construction, and it applies admirably to such a case.

The procedure and verdict have called forth the unqualified approval of an alienist of wide repute, although his views have themselves in turn been contested by another. The views of the former alienist may be summed up as follows:—(1) That persons in the mental condition of Mr. B. should not be at large until some crime is committed; (2) that accused's position is a happy one, and that everybody should be satisfied—the public, the alienist, the Crown, and the accused; (3) that the position taken up by the Lord Justice-General (Dunedin) will form on the especial point of insanity an era in Scottish criminal jurisprudence; and (4) that questions of this kind should be left to judges and doctors. Some of these points have found adverse critics in the press in the persons of alienists and laymen who know about what they write. One layman very sensibly asks how is such a man to be dealt with until he commits a crime or threatens to do so? No answer to this has hitherto been vouchsafed, and it is doubtful if a feasible one ever can be. The leaving of such matters entirely to judges and doctors is opposed to the spirit of the age, and is not likely to find favour. It is assuming too much that everyone should be satisfied, especially Mr. B., his relatives, and counsel. That the procedure followed forms a new era in Scottish criminal jurisprudence pitches the matter in too high a key. It is simply the law which five years ago Lord Young at Glasgow, in the Cambuslang murder case, brought into requisition, although no medical evidence as to insanity was led. He satisfied himself, after the usual evidence of the crime was unfolded, and also the jury, that the author of the murder must have been of unsound mind, and the accused was relegated to the Criminal Lunatic Asylum at Perth, where Mr. B. of Cumnock is now along with other fifty patients. Another alienist disputes the views stated, and remarks unfavourably on the criminal asylum and its inmates to which accused has been sent. It is to be feared that this alienist has neither been in Perth nor in Broadmoor. Classification of inmates is made there as in an ordinary asylum, and at Perth there are for fifty patients three gradings, quite as numerous a classification as will be found in an ordinary asylum with 500 to 600 patients. In both of these criminal asylums he will find more sane persons, in proportion, than he will find in any ordinary asylum, owing to the establishment of the plea of "insane at the time" in so many cases. There are as dangerous epileptics, homicidals, paranoiacs, and impulsives in an ordinary asylum as there are in criminal asylums. It is as often as not a mere accident that determines whether an alcoholic, an epileptic, paranoiac, homicidal, or impulsive lunatic shall for the commission of grave crime spend years of his life in an ordinary or in a criminal asylum. From time to time in ordinary asylums, such insane persons as those described commit homicide with lethal weapons on attendants or fellow-patients, and proceedings are taken, insanity in bar of trial being set up, resulting in confinement during His Majesty's pleasure in a criminal asylum, or, although insane, they may be proceeded against under sec. 15 of the Lunacy Act of 1864, and sent to an ordinary asylum under safeguards.

As to the question of removal from the criminal to an ordinary asylum, on representations being made, the Secretary of State, by his sign-manual, can remove Mr. B., under adequate safeguards as to discharge, from Perth to an ordinary asylum, in which he can be kept at his own charge instead of the country's as at present, and possibly both he, his relatives and counsel, would prefer this. More than likely it will follow before long.

After hearing the convincing evidence of accused's own medical attendant and of two experts, and the clear statement as to insanity of the presiding judge, in this case, the verdict is one with which medical jurists will agree. One medical critic thinks it follows out and applies in practice the dictum of Sir James F. Stephen in his "History of the Criminal Law of England" as to what that law ought to be. "No act," says Sir James, "is a crime if the person who does it is prevented either by defective mental power, or by any disease affecting his mind, from controlling his own conduct, *unless the absence of the power to control has been produced by his own default.*" The words in italics destroy the value of this dictum, and the Lord Justice-General's is free from this qualification, and is likely to form in Scotland a precedent on this point. The cause of a person's insanity in a court of justice is of no moment. The point to be determined is, is he insane? quite irrespective of the cause.

In conclusion, it is not claiming too much to hold that our criminal laws as well as our lunacy laws leave, on the whole, little to be desired, and are calculated to meet fairly any case which may arise. Under them the liberty of the individual, as well as the safety of the public, is safeguarded.

Dr. Peters of Toronto.

It is not customary in this Journal to publish obituary notices of those who have not been directly connected with the Edinburgh School, but the sudden and lamented death of George Peters, which took place before he had completed the paper which appears in the present issue of the Journal, requires that we should record our regard for him as a man, and our admiration for him as a surgeon.

His career was not unlike that of others who have ultimately attained to high distinction in the profession of Medicine. Without money and without influence, he climbed every step of the ladder from the lowest to the highest by his indomitable energy, his outstanding ability, and his remarkable capacity for work. While still a comparatively young man, he was regarded as the most talented surgeon in the great Dominion of Canada. He was not only a well-informed teacher and a capable operator, but he was also a man of marked originality, and had discovered new fields for surgical enterprise when these remained unrevealed to his contemporaries.

We tender our very sincere sympathy to the members of his family, and our condolences to the Faculty of Medicine of the University of Toronto, which by his untimely death has lost one of its most distinguished professors.

AT the recent graduation ceremonial a fitting recognition was made of the intimate association which has always existed between the University and those States of the Empire beyond the seas which send so many of their sons to imbibe the teaching and traditions of our Alma Mater.

In conferring the honorary degree of Doctor of Laws upon the Premiers of New Zealand, Cape Colony, and Natal, the University bestowed its highest honour upon men who, both in themselves and in virtue of the high offices to which they have attained, were well worthy to receive it.

Amongst other recipients of honorary degrees, there were two whose names more particularly appeal to the sympathies of all interested in medical science—one, that of an old graduate of this University, who first applied himself to the study of morbid anatomy within its walls and in the Royal Infirmary—Dr. D. J. Hamilton, Professor of Pathology in Aberdeen University; and the other, Sir John Tweedy, a man of varied culture, and pre-eminent amongst living representatives of that branch of the healing art to which his best energies have been so successfully devoted.

Certainly not less worthy of being honoured was the Rev. John Kelman, whom we heartily congratulate upon this recognition of the far-reaching influence he has for many years exerted upon the student life of the University.

St. Mary's Hospital, Rochester, U.S.A.

The Annual Report of St. Mary's Hospital continues a record of surgical achievement which we believe to be unrivalled. Founded seventeen years ago by the Sisters of St. Francis in a small country town in the centre of an agricultural and sparsely populated state, the hospital has already received and cared for over 20,000 patients, and with a maximum of 150 beds there have been performed within its walls during the last twelve months no less than 4770 operations. These cover the whole range of surgical practice, and include the following: 125 adenoids and tonsils, thirty-three cataracts, 155 goitres (with two deaths in the exophthalmic variety), fifty-seven Halsted operations for cancer of the breast, thirty-six perineal prostatectomies with one death, and 2570 abdominal operations, including herniotomy, with a total death-rate of 2·07 per cent. There are 371 operations for acute and suppurative appendicitis, with two deaths; 543 appendectomies, with one death; 122 cholecystectomies, with two deaths; 155 cholecystotomies, no death; 385 hernias, with one death; and forty-one nephrectomies, with three deaths. The operations were performed by the brothers W. J. and C. W. Mayo, and by the junior surgeon, Dr. Judd. There were 3198 general anaesthesias without fatality. Ether was given in all, except sixty-five by the open "drop" method.

We venture to affirm that these results constitute a record which will bear comparison with that of any hospital in the world.

ORIGINAL COMMUNICATIONS.

EXOPHTHALMIC GOITRE IN ITS RELATION TO OBSTETRICS AND GYNÆCOLOGY.

By Sir Halliday Croom, M.D., *Professor of Midwifery in the University of Edinburgh.*

The relationship of exophthalmic goitre, known as Graves' disease or Basedow's disease, to pregnancy, parturition, and to various forms of gynæcological disease, has received comparatively little attention in this country, and as I have observed a number of cases within recent years, I venture to record some conclusions I have arrived at, although I fear in the main they are negative.

It is unnecessary to describe the symptoms characteristic of this disease, nor in a short paper can I deal with the theories as to its etiology. Suffice it that amongst many supposed causes brought forward by various authorities we find changes in the blood, changes in the heart muscle, enteroptosis, floating kidney, auto-intoxication from digestive disorders, impairment of the lymphatic circulation, changes in the ganglion cells of the cortex, changes in the medulla, lesions of the sympathetic, lesions of the restiform bodies, and finally hypersecretion of the thyroid gland.

This last point, the question of the thyroid, is an extremely difficult and important one. Richardson, whose essay on the subject is classic, says that the spontaneous enlargement and hypersecretion of the gland is more than improbable: and Gibson, in his able and valuable paper on "Adaptation and Compensation," condemns non-functional hypertrophy in any part of the human organism in characteristic language as "a base figment of the imagination."

As we shall see later, there seems to be a direct relationship between pregnancy and the thyroid, a point to which attention has been drawn recently by the researches of Nicholson and others into the connection between eclampsia and the thyroid gland. And if we consider the undoubtedly close connection between the thyroid and metabolism and assimilation, we must at least admit the plausibility of Thomson's claim that the *causa causans* is a toxæmia, and that this produces a perversion or an increase in the quantity of the thyroid secretion. It is certain that pathologically the changes which take place in the thyroid gland are usually a parenchymatous hyperplasia with changes in the colloid material and degenerative changes in the protoplasm and nuclei. There is, however, no definite histological change in the organ that can be called specific of exophthalmic goitre, and all the above changes may be found in patients who present none of the symptoms of Graves' disease.

The disease is, roughly speaking, ten times more common in women than in men. This I take to be an undisputed fact. But, judging from the statistics of my own hospital work, which has been entirely confined to the Maternity Hospital and the gynæcological wards of the Royal Infirmary of Edinburgh, it would seem to be a comparatively rare condition associated either with pregnancy or uterine affections. At all events, looking back over my work in the Maternity Hospital, and going over the statistics of the hospital, which include 15,000 cases, I have only met with one case in which there was any reference made to goitre, and in that case there were neither tremors nor exophthalmos. During the fifteen years in which I had charge of the gynæcological ward in the Royal Infirmary, I met with only two cases of exophthalmic goitre which were associated with uterine affections; to these I shall refer later. I have occasionally seen cases of exophthalmic goitre in association with my colleagues in the ordinary medical wards of the Royal Infirmary, but in these cases, except irregular menstruation, there was no affection of the genital organs whatever.

It must therefore be apparent that the disease must be more common in the better classes than amongst those who attend hospitals; and from all that is known of its etiology, this is just what one would expect of a disease arising, as it does very often, after shock and mental anxiety in highly strung nervous systems.

When regard is had to the age at which exophthalmic goitre is most prevalent, we find that it coincides with the active period of uterine life. Taking a table from Murray's most interesting paper, I find that the youngest case was 15 years old and the oldest 65. The most common period lay between 16 and 35, but quite a number occurred between the ages of 40 and 50, a period coinciding with the normal changes which take place in the genital system at the menopause.

That there is a relationship between the generative apparatus and the thyroid, there can be no question. My experience entirely coincides with that of Martin, whose extremely able and interesting paper has just been published, that a great many girls suffering from exophthalmic goitre have special discomfort during menstruation, and I have noticed that the thyroid gland enlarges in some cases at the same time. It is not necessary, nor in my experience is it common, to have pathological conditions of the pelvic viscera associated with exophthalmic goitre. It seems to me that the periods when exophthalmic goitre is most likely to be developed or exaggerated, are the three epochs when the generative system is at the height of its activity,—at puberty, at menstruation, and during pregnancy. May I quote a sentence from Martin's excellent work: "Growth is more active than ever at the age of puberty, and with the onset of activity of the generative organs the vitality of all parts of the organism is raised, and the glands involved in the metabolism are put to an unprecedented strain; especially is this so in the female sex."

The question of the condition of the thyroid during pregnancy has received a very considerable amount of attention. That there is a greater or less increase of its volume during pregnancy seems to me to be beyond dispute, and that it gradually disappears after delivery is an ascertained fact. Freund it was who first systematically examined the relations between the thyroid gland and the female genitals. He arrived at the conclusion that the relation occurs not through the nervous system but through the blood. Heidenreich was of opinion that the pregnant uterus hindered respiration, and thus led to an accumulation of blood in the gland. The general opinion, however, seemed to be that the enlargement was sympathetic. Such was the way the question stood when Lange approached the subject, and in a very interesting and original paper discussed the matter, taking his statistics from observations made by himself from October 1893 to January 1898. The result of his examinations very much corroborated those of Freund, and he found that a hyperplasia of the thyroid was an almost constant concomitant of pregnancy. Lange made his observations most carefully, eliminating all apparently obvious causes leading to mistake. It is, for instance, the tendency of many pregnant women to put on fat, and therefore he only took women with thin necks, so as to make no possible error; and, furthermore, in measuring the neck after accouchement, especially after tedious labour, he only did so after twenty-four hours, as the neck is apt to be turgid and swollen immediately after labour.

The important conclusion he arrived at was that hyperplasia of the thyroid is a physiological appearance in pregnancy, and that in the majority of cases it begins about the sixth month, and ceases at an indefinite period after labour. He points out that with kidney affections peculiar to pregnant women there is no hyperplasia, and in an able paper by Nicholson this matter is very fully discussed. Upon this matter I have no intention of entering to-night.

Considering, therefore, the frequency with which this disease occurs; considering, further, the fact that it occurs in women during the active period of menstrual life; considering, further, the intimate connection which apparently exists between the thyroid gland and menstruation and pregnancy,—one would naturally expect to have exophthalmic goitre more commonly associated with uterine conditions than seems to be the case.

Kleinwächter, in his work published in 1890, paid particular attention to the relationship between the sexual organs and this disorder, pointing out that in many cases the sexual development was wanting. In the case which he particularly described there was a loss of the hair: the mammary glands were atrophied, almost completely so; the mons veneris was poor in adipose tissue and destitute of hair: the labia were flabby, especially the minora; the vulva was gaping: the whole vagina was loose, with slight prolapse of the anterior vaginal wall; the portio vaginalis was scarcely the size of a kidney bean; the uterus was sunk down, the cavity was small, with the walls very thin and flabby; both ovaries were small and tender. These changes, in fact, entirely correspond with senile marasmus. Similar changes in the sexual sphere were noted by Möbius and Cheadle.

Cholmogoroff records a case as follows:—A woman, æt. 32. Eight previous full-term labours, last in November 1892. Well built; moderate development of subcutaneous fat; no exophthalmos; slight tremor of the hands; frequent and severe attacks of palpitation, which had existed before marriage, and had been explained by the doctor as due to anæmia. There was considerable increase of the thyroid gland. This increase in the thyroid was noticed in the fourth pregnancy. The gland gradually grew larger with each pregnancy. Patient's mother, æt. 60, had a large goitre, and a sister a smaller one. In the mother and sister there were no symptoms of Graves' disease.

The patient came under Cholmogoroff's care owing to a bleeding of three weeks in connection with an incomplete abortion. The breasts atrophied in spite of the pregnancy; before this the breasts had been well developed. In the end of 1893 there occurred a tenth pregnancy, resulting in abortion. The symptoms became worse in each succeeding pregnancy.

Jouin refers to a connection between the menopause and Graves' disease. He observed in forty-three cases that the uterine lesion preceded the Graves' disease. Improvement in the local condition, he avers, is always accompanied by improvement of the general condition.

Doléris, on the other hand, believes that the treatment of the uterine disease might cure women having tachycardia simulating Graves' disease, but in the case of those having true exophthalmic goitre it would be imprudent to promise to cure them of their goitre by treatment directed against their uterine disease.

In those cases that have come under my own observation I have only met with abnormality in the sexual organs in three cases.

Case I.—Sent to me by Dr. Haggart of Aberfeldy. The patient had well-marked exophthalmic goitre. She was sent to my care specially because she was suffering from profuse menstruation and recurrent attacks of retention of urine.

On examination, a fibroid tumour was found blocking up the pelvis. On placing the patient under an anæsthetic, she expired at once, before she had been touched with a view to operation. This case is particularly interesting to me, as it is the only case that I ever lost under the administration of an anæsthetic. Unfortunately, no post mortem was permitted.

Dr. Luke, the anæsthetist to the Royal Infirmary, informs me that exophthalmic goitre is one of the most trying cases with which an anæsthetist has to deal. They are in many ways worse than a simple goitre or Derbyshire neck, as, owing to the extreme nervousness of the patient and the great vascular excitement, the conditions favouring sudden cardiac failure are present in a marked degree, and conditions are not improved by the possible, and indeed probable, narrowing of the air-way by the thyroid growth. Such cases he would place, as far as risk is concerned, alongside of aortic aneurysm, and bad cases of mitral stenosis and tricuspid regurgitation.

Case 2.—A single lady, æt. 50, with extremely marked exophthalmic goitre, with profuse hæmorrhage almost continuous. She had a large ovarian tumour on the right side, and a polypus projecting from the cervix. She had been practically bedridden for two years, as much owing to the Graves' disease as to the hæmorrhage.

I first of all removed the polypus, and some time afterwards performed ovariotomy. She made the usual recovery, and at the end of a month left the Home. It is interesting here to observe the fact that six months afterwards the goitre had very considerably diminished, and the exophthalmos, tremor, and tachycardia were very much better. At the end of three years, although still an invalid, and unable to support herself by her own exertions entirely, the symptoms were very much ameliorated.

Case 3.—One of the most interesting cases I have met with was that of a girl with well marked exophthalmic goitre, who had reached 20 years of age and had not menstruated. It was for the local condition she was brought to me. On examination, I found that the amenorrhœa was due to an imperforate condition of the hymen, which was bulging, and there was a distinct tumour on the right side supra-pubically. She had had regularly for years back the usual monthly discomfort, but no hæmorrhage at all. I treated the case in the usual way, and she made an excellent recovery. There was no marked change in the condition of the exophthalmic goitre. I saw her ten years after that, and she still suffered from invalidism, due to her tremors and tachycardia.

I have no record of any special abnormality in the sexual organs of those cases where the disease occurred in young single women, except that, in the majority of cases, the tendency was rather to menorrhagia than to amenorrhœa. In one only, after the continuance of the disease for some years, amenorrhœa became developed. But as the girl's emaciation was extreme, and no obvious benefit was to be got from local examinations, none was accordingly made.

On the other hand, I have seen two girls in whom the disease developed just after puberty. Neither girl menstruated until she was about 20, and then only scantily. Both married, and were sterile. On examination, I found an infantile condition of the pelvic organs.

Kleinwächter refers to two cases in young women, in the first of which menstruation was retarded and scanty: and in the second case the menstrual period lasted six weeks.

Hoedemaker records the case of a young woman, æt. 29, who had suffered from exophthalmic goitre for two years. In her he found changes similar to those that describe the climacteric.

Bamour also records a case in which the uterus was atrophied, and the ovaries and tubes not palpable.

On the other hand, in my experience, I have found, as I have said, that menorrhagia is the symptom when the disease is early and progressive, and amenorrhœa only pronounced when the disease is far advanced, or when it occurs very early in puberty.

With regard to the occurrence of the disease in older unmarried women, I have had occasion to examine ten such. In not one of these ten cases have I found anything abnormal, except irregular and, for the most part, profuse menstruation. I am driven to the conclusion, therefore, that in many cases recorded the atrophy of these organs was due more to the psychic effect than to any result of the actual disease, mental shock being, as I have already said, a very frequent cause of this condition. Nothing is more common than to find that the menstrual function is disturbed by psychic and mental conditions, and to these I attribute the amenorrhœa rather than to the existence of the disease itself.

Furthermore, it must be kept in view that in a large number of the cases recorded, the amenorrhœa and atrophy were the consequences not of the disease itself, but of its exhausting influences and long duration.

Out of fifteen cases occurring in women under 30 years of age, which have been under my own observation, or have been seen with others, where a local examination was made, no apparent lesion of the pelvic organs could be discovered. An interesting point is that there was no record of any dysmenorrhœa, and that the condition of the flow was rather increased than otherwise.

So far as the histories of my cases are concerned, the onset in every one had followed more or less nervous shock. One specially interesting case was that of a girl, æt. 26, who, in addition to well-marked Graves' disease, had profuse menstrual discharge, and at the same time had monthly attacks of mania coincident with her menstruation, so bad that on several occasions she had to be confined in the padded ward in hospital. In this case, after consultation with my colleagues, I removed her ovaries, with a view first of all of controlling the hæmorrhage, and secondly, in the hope that the removal of the ovaries might also have the desired effect upon the mania. I heard from her regularly for two years after the operation, and she remained free of the maniacal attacks during that time, but her condition of exophthalmic goitre remained unchanged, although the menopause had been completely established.

Sänger reports three cases of women he examined with this disease. In one case there was amenorrhœa, which Sänger explains as lactation amenorrhœa. The uterus was not atrophied.

In the second case the menses were somewhat scanty, but this Sänger attributes to the approaching climacteric and the marked adiposity of the patient. In this case also the uterus was not atrophied.

In the third case the woman was pregnant.

In these three cases, therefore, Kleinwächter's contention that this disease is associated with atrophy is not borne out. On the other hand, some, like Caracoussi, have described several cases where there has been atrophy of the mammæ.

Therefore, from my own experience, as well as from the records of the cases that have been reported, especially abroad, I must arrive at the conclusion that there is no interdependence between pelvic disease and Graves' disease, because the same conditions, such as fright, or mental shock, which would precipitate Graves' disease, would at the same time affect the pelvic organs as well.

With regard to the effect which pregnancy has on exophthalmic goitre and *vice versâ*, as I have already pointed out, this disease is practically unknown in the Maternity Hospital in Edinburgh, and therefore the records of the cases which occurred under my charge are all from my private case book.

I have myself observed twelve cases of exophthalmic goitre during pregnancy, with the following results. In all of them the condition as to eyes, thyroid, and heart was very marked. It would extend this paper beyond due limits were I to record these cases in detail: enough for me to say that in eight of the twelve, the course of pregnancy was unaltered, and the delivery was uncomplicated, and, so far as I was able to judge, the affection in each of those eight cases was aggravated for a time after the labour was over.

Of the four remaining cases, in Case 1, the patient, æt. 30, had post-partum hæmorrhage, so profuse as to require the uterine cavity to be plugged. She recovered slowly from her hæmorrhage, and afterwards suffered from superinvolution of the uterus. The labour took place eight years ago, and she has not menstruated since, and the uterus and ovaries remain small and atrophied. The exophthalmic goitre, though somewhat modified, is still sufficiently marked to make her an invalid. In this case I attribute the atrophy of the uterus and ovaries to the excessive hæmorrhage.

The second case was seen with the late Dr. Duddingstone

Wilson. A lady, æt. 34, five months advanced in pregnancy of a third child. Well-marked exophthalmos; the thyroid very considerably enlarged; pulse 140 per minute; marked tremors; profuse perspiration. I was asked to see the case because of some hæmorrhage; diagnosis, accidental hæmorrhage; treatment, as the hæmorrhage was slight, palliative. The symptoms of exophthalmic goitre had been present for six months before her present pregnancy, and had been induced, as she believed, by a fall from a dogcart. Previous to that accident, she had been in good health, rather robust; since then she had become emaciated until the occurrence of the present pregnancy, when her symptoms became slightly aggravated, until during the past five months she had become very much emaciated, and been unable for her household duties. As the hæmorrhage increased very markedly, it was determined to terminate the pregnancy, and this was done by dilating the cervix and turning. The placenta was found in its normal situation, the hæmorrhage was comparatively slight, and the patient recovered very slowly from the immediate interference.

In Case 3, I was asked to see a patient, æt. 29, pregnant of a first child three months, because of symptoms of miscarriage. When I saw her she had well-marked exophthalmic goitre, the exophthalmos being very pronounced, and the goitre but slight. The pulse was 130 per minute, and the tremors, though present, were not striking. The miscarriage when I saw it was inevitable, the os being open and the ovum protruding. I therefore emptied the uterus, and although every precaution was taken, the hæmorrhage was so profuse that she was reduced to profound anæmia, and remained in bed for three months. During this time, although the lines of treatment were mainly those for anæmia, and no special treatment was given for the exophthalmic goitre, yet in the course of the three months her symptoms of exophthalmic goitre very much diminished; the exophthalmos was less pronounced, and the pulse fell to under 100. It is well worthy of notice that in this particular instance the result of the profuse hæmorrhage was that the patient developed superinvolution, and that there was no menstruation again for twelve months afterwards.

I saw Case 4 only after delivery was over, and that because of a severe convulsion three hours after delivery. The convulsions occurred at varying intervals, and with increased rapidity, until the patient died during an attack. She had had during the whole of her pregnancy and for a year before well-marked exophthalmic goitre, with the usual group of symptoms of exophthalmos, goitre, tremors, and tachycardia.

There is no lack of cases recorded showing that pregnancy considerably favours the formation of this disease. There are also many cases recorded by others which show that pregnancy often makes this disease considerably worse. Considering the high degree of susceptibility of the nervous system, and the well-marked hydraemia and anaemia characteristic of pregnancy, results such as this are what one would expect.

In a recent paper, Wilson of Birmingham records eight cases of exophthalmic goitre in pregnancy which had come under his notice. In only two did menstruation continue normal. In two there was menorrhagia, in four there was more or less amenorrhoea, and in one of these there was premature atrophy of the sexual organs.

Trousseau and Charcot taught that pregnancy had a favourable influence on exophthalmic goitre, but they were unaware of the fact that the thyroid gland enlarges during pregnancy in the normal condition. Bucquet, again, on examination of twenty-one cases, arrived at the conclusion, first of all, that exophthalmic goitre can be provoked by pregnancy at a date more or less remote from confinement. The cases he quotes, however, are very uncertain, and his conclusions very indefinite. Further, he points out that when exophthalmic goitre occurs previous to pregnancy, the influence exerted by the pregnancy upon the goitre is very uncertain; in his own words, it may be "either neutral, benign, or aggravated." He further quotes three cases, two of which seem accurate, that pregnancy may transform simple goitre into an exophthalmic goitre; and of the ten cases in which pregnancy occurred during exophthalmic goitre, one was unaltered, three were aggravated, and six were improved. He arrives at the conclusion, therefore, that amelioration of the symptoms is to be expected when pregnancy occurs in a woman suffering from exophthalmic goitre. But his conclusions must be taken with a certain amount of reservation, because at least seven of the cases which he quotes were complicated by typhoid fever.

A more recent contribution to the subject is that of Audebert of Paris. He records a case in which the disease developed in the seventh month of pregnancy. There was a goitre and exophthalmos, as well as much anasarca and scanty urine. Delivery was followed by partial recovery, although the tremors and exophthalmos persisted. Audebert is inclined to look upon the disease in this case as a manifestation of the auto-intoxication of pregnancy. While a conclusion cannot be deduced from one case, the theory is interesting and suggestive in view of our increasing knowledge of the complex relationships of the thyroid in pregnancy.

To bring the whole matter to an issue, it seems to me that the conclusions to be arrived at are as follows:—

First, that exophthalmic goitre is a comparatively frequent disorder of women.

Secondly, that the thyroid is enlarged during pregnancy.

Thirdly, that exophthalmic goitre and pregnancy are a very rare combination, as shown by the fact that out of 15,000 cases I have not met with one in hospital practice, and with only twelve in private and consulting practice.

Fourthly, that the influence of pregnancy upon exophthalmic goitre is very uncertain, and that in the majority of cases it aggravates it.

Fifthly, that the effect of exophthalmic goitre on pregnancy is practically nil; and that, so far as my observations and those I have collated from other sources abroad go to prove, most pregnancies complicated with exophthalmic goitre follow a regular even course; and that of the accidents that occur, the most frequent is hæmorrhage, and occasionally abortion.

Sixthly, that the relation between pelvic disease and exophthalmic goitre is rare, and that the effect of exophthalmic goitre on the reproductive system is in recent cases to cause irregular menstruation, mostly in the direction of menorrhagia, while in very advanced cases it may cause amenorrhœa.

From these conclusions it must be apparent, therefore—

1. That girls suffering from exophthalmic goitre need not be precluded from marrying.

2. That after marriage they need not be precluded from pregnancy.

3. That if pregnancy occurs, there is no reason, except in advanced cases, to interrupt the pregnancy, even in spite of the fact that the children of women with exophthalmic goitre may be expected, according to some authorities, to develop neuropathic manifestations.

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SOME POINTS IN THE HISTORY AND TECHNIQUE OF THE SUBMUCOUS RESECTION OF THE NASAL SEPTUM.

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A great deal has been written in the course of the last few years on the subject of the submucous resection of the nasal septum. Numerous methods, with many modifications, have been published, and a host of special instruments have been devised for the operation. I venture to give my views on the more debatable points in the technique of this operation, partly because I have repeatedly seen it performed by German rhinologists, and partly because I have myself frequently carried out the procedure during the past eighteen months. That further discussion is called for, is, I think, sufficiently evident, as there is no uniform method of carrying out this operation—an operation which is generally admitted to be the most difficult in intranasal surgery.

There can, I think, be no doubt in the mind of any man who has mastered the technique, that submucous resection of the septum is now the only rational operation for treating deformities of that structure which interfere with nasal respiration, excluding, however, from this category those cases where there is a spur or ridge on the septum, but where the latter is not bent itself, and perhaps cases affecting the cartilage alone. Undoubtedly the operation takes more time and is much more difficult of execution than the older methods of Asche, Moure, and Adams, but the functional result is almost immediate, while the after-treatment is practically nil. Zarniko, writing on this subject, says: "The operation has no substitute, and therefore deserves to be numbered among the typical operations of which every rhinologist must be a master."

To Petersen[1] is due the credit of first carrying out a submucous resection of the nasal septum: he used a general anæsthetic, but did not apparently avail himself of artificial light. Having turned up a quadrangular flap of mucous membrane from the convex side of the septum, the base of the flap being upward, he removed the deviated cartilage. The flap of mucous membrane was then stitched down to the raw surface, but to avoid tension only a few sutures were inserted. The incision he adopted would obviously be impracticable when dealing with a marked deviation reaching far back in the nose, because the whole flap must be raised before any cartilage is removed.

A year earlier, Hartmann[2] had removed spurs while preserving the mucous membrane covering them, and, together with the spur, a small portion of the deviated septum. He did not, however, attempt any real resection of that structure.

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[1] *Berl. klin. Wchnschr.*, 1883, No. 22.

[2] *Deutsche med. Wchnschr.*, Leipzig, 1882, No. 51.

Petersen's paper appears to have attracted but little attention, and the development of the operation, or rather the practical application of it in rhinology, is due to Krieg.[1]

The operation of this author was a great advance on that of Hartmann and Petersen, for it was applicable to all cases of deviated septum, it was performed under local anæsthesia, and if necessary bone was removed as well as cartilage. The disadvantage lay in the destruction of the mucous membrane on the convex side of the septum. Krieg raised a square flap, operating from the nostril of the narrow side, the base being behind; because, as he states, it is impossible to predict how far back it will be necessary to go when dealing with a marked deviation. All deflected cartilage and bone is then removed, the utmost care being taken to avoid a perforation.

Krieg's paper was overlooked by nearly all rhinologists, and he again wrote on the subject in 1889.[2] He had now modified his technique by using the galvano-cautery to make the primary incision, and he had devised a special pair of forceps for removing the cartilage and bone. In spite of this second paper, but few specialists seem to have taken to the operation; possibly they were deterred by the difficulty of its execution and by the length of time required for its performance.

Bönninghaus[3] in 1899 described his method of performing the Krieg operation; overlooking the fact that the latter removed bone when necessary, he claims this step as an advance on the older procedure. Bönninghaus injects a ½ per cent. solution of cocaine into the convex side, and rubs in a 20 per cent. solution of that drug on both sides. He uses an angular incision, the angle opening backwards; he then separates a flap of mucous membrane. The cartilage is next incised either in a horizontal or in a vertical direction, and a finger is inserted into the other nostril while this is being done. The cartilage is then divided by a pair of scissors and broken away with forceps; afterwards as much bone as is necessary is removed; finally the flap on the convex side is resected, and the nose is plugged for a day. A nasal douche is used daily till healing takes place, *i.e.* for from four to eight weeks. Bönninghaus does not take any special precautions to avoid a perforation.

Cholewa[4] in 1891 published a method which differed from Krieg's in that he used a hammer and chisel, the latter of his own pattern, for removing the cartilage and bone. He, like Bönning-

[1] *Med. Cor.-Bl. d. württemb. ärztl. Landesvereins*, Stuttgart, 1886, Nos. 26 and 27.

[2] *Berl. klin. Wchnschr.*, 1889, No. 31.

[3] *Arch. f. Laryngol. u. Rhinol.*, Berlin, 1899.

[4] *Monatschr. f. Ohrenh.*, Berlin, 1891, No. 9.

haus, claimed to have been the first to remove bone, not having apparently read Krieg's paper.

Among the papers belonging to this group, one by Muller[1] may also be mentioned.

The next real advance in the technique is due to Killian[2] in that he preserved both flaps of mucous membrane and so reduced the time of healing from several weeks to as many days and also obviated the risk of subsequent crusting on the extensive scar tissue which results from the Krieg-Bönninghaus operation.

Killian's first communication on the subject was read in 1899, but a detailed description of his operation was not published till 1904.[3] The following are the essential points in his well-known method:—One cm. of a ½ per cent. solution of cocaine containing 4 drops of adrenalin is injected into each side of the septum, after a 20 per cent. solution of cocaine has been rubbed in.

The patient sits upright, and a vertical cut is made on the convex side of the septum ½ cm. behind its anterior border. A flap of mucous membrane and perichondrium is then raised, the operator beginning the separation with a sharp and continuing it with a blunt elevator. When a sharp spur is present, the separation is only carried as far as the free edge of the crest. The cartilage is next incised, a finger being placed for protection in the opposite nostril. The flap on the concave side is then raised, and the cartilage is cut out, using the speculum for median rhinoscopy to hold back the flaps, while the cartilage is divided by Killian's special plough-like knife; the bone is then resected by Hartmann's forceps. The anterior end of the vomer is removed by a hammer and bent chisel. If a stitch is required, a special needle is used to pass the suture, while a fine hook is employed to catch the loop. Both sides of the nose are packed for two days after the operation.

Killian's first communication was not widely read, and it is not therefore surprising that others should have made a trial of a method similar in principle to his. Thus we find Hajek[4] and Menzel[5] writing on this subject, and the latter, who is, or was then, Hajek's assistant, claimed to be the first to revive the true submucous resection of Petersen.

Menzel's incision is made on the free edge of the quadrilateral cartilage; he uses Schleich's method of anæsthesia, and removes the lower part of the septum with chisel and hammer. Both nostrils are plugged for two days, and the side from which the operation was carried out is dressed for a further period of one or two days.

Among other papers in German literature, one by Weil[6] may be mentioned. This author states that he had preserved both flaps before Menzel. He also describes special knives, having blades at right angles to the shaft, for dividing the denuded cartilage. They are, however, similar to those used by Freer, a description of which had been published some years previously.

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[1] *Arch. f. Laryngol. u. Rhinol.*, Berlin, Bd. xv. S. 312.

[2] *Verhandl. d. ges. deutsch. naturf. u. Arzt.*, Munchen, 1899.

[3] *Arch. f. Laryngol. u. Rhinol.*, Berlin, Bd. xvi. S. 362.

[4] *Ibid.*, Berlin, Bd. xv. [5] *Ibid.*, S. 48. [6] *Ibid.*, Bd. xv. S. 578.

Zarniko,[1] taking part in the "Prioritätsstreit" so dear to the heart of a German, attributes to Killian the priority in preserving both flaps of mucous membrane. He finds a very simple instrumentarium sufficient, but he uses the galvano-cautery instead of a knife to make the primary incision, and he does not plug the nose at all.

Meanwhile in America the method had also received considerable attention, and two names are especially associated with it, namely, Freer and Ballenger.

Freer[2] has written a number of papers dealing with this operation. In the first he states that Ingals had performed a submucous resection of the septum in 1882, that is, before Petersen; he does not, however, give the reference, and I have been unable to find the paper.

Freer's method is characterised by the peculiarity of his incision, the large number of instruments he employs, and the length of time required for the operation. The patient is placed either in a half-lying or sitting position, and Freer uses Kirstein's forehead lamp. In most cases he adopts a reversed L incision, and turns forwards a triangular flap. The incision is made with a special knife. On first incising the cartilage, he does not put his finger in the opposite nostril. To remove the cartilage, he uses Ingals' knives; these have small blades at right angles to the shaft. To remove bone, Freer uses a pair of Grünwald's forceps, modified by himself. He does not insert any stitches; he plugs the nose with strips of sterilised absorbent lint, powdered with subnitrate of bismuth. The strips are ½ cm. broad and 25 cm. long; they are stretched on a probe, and laid in the nose in layers. The packing is left in till the fifth day.

Ballenger[3] operates after Killian's method, but has simplified the technique by the introduction of an extremely ingenious swivel knife, which enables the operator to cut out the cartilaginous septum in one piece; there is thus a very considerable saving of time.

Among other American writers, Yankauer[4] may be referred to. He operates after Killian's method, but varies the incision by extending it outwards along the floor of the nose; by this incision he claims to get better access.

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[1] *Arch. f. Laryngol. u. Rhinol.*, Berlin, Bd. xv.

[2] *Am. Journ. Med. Sc.*, Phila., 1902, March; *ibid.*, 1903, December; *Berl. klin. Wchnschr.*, 1905, No. 39; *Arch. f. Laryngol. u. Rhinol.*, Bd. xviii. Heft 1.

[3] *Ann. Otol., Rhinol., and Laryngol.*, 1905, quoted from *Centralbl. f. Laryngol.*

[4] *Laryngoscope*, 1906, April, quoted from *Centralbl. f. Laryngol.*

Mouret and Toubert[1] contribute an interesting paper to the French literature. Their paper deals mainly with anatomical considerations, and gives a survey of the various methods, orthopaedic and otherwise, of dealing with septal deformities. Their own method of performing the submucous resection presents no special features, except that they prefer the galvano-cautery for making the primary incision, and they vary the latter according to the deformity.

In England the operation has a shorter history than in Germany or in America. Greville Macdonald[2] in 1888 published a method of treating ecchondrosis of the cartilage with deviation, similar to that adopted by Hartmann, though he had apparently arrived at it independently. In 1905, Smurthwaite[3] read a paper on submucous resection of the nasal septum before the Laryngological Section of the British Medical Association. He showed a sharp elevator of his own design, and a modification of Killian's knife. He uses a local anæsthetic—eucaine β 2 per cent., and adrenalin.

An interesting discussion[4] took place in Toronto last year, during the annual meeting of the British Medical Association, on the "Treatment of Deviations of the Nasal Septum." The discussion, which was almost entirely restricted to the methods of performing a submucous resection, was opened by St. Clair Thomson. His method, previously published,[5] follows Killian's in all essentials, except that he does not inject cocaine, that he uses Ballenger's knife to remove the cartilage, and that he places the patient in the recumbent position during the operation. Tilley, in his contribution to the discussion, said that he preferred to use a general anæsthetic, that he always removed the anterior half of the inferior turbinate on the side opposite to the deviation, and he stated that the operation could be performed in from fifteen to twenty minutes, even in the most difficult cases. Considering that Tilley uses a general anæsthetic, this is indeed a remarkable performance.

Williams, to avoid perforation when cutting through the cartilage, found it advantageous to make a small primary puncture on the concave side, well forward, which would allow the passage of a long narrow elevator. By means of this instrument the cartilage was bared, where later it would be incised from the convex side.

Freer argued in favour of his method, and felt sure that recommendations which he advocated as proper would in time win their way as operators experienced their value.

Having shown in the foregoing survey of the more important papers dealing with this subject how diverse the methods of different writers are, I shall now turn to the discussion of the details of the operation.

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[1] *Rev. hebd. d. Laryngol.*, Bordeaux, 1906, May.

[2] *Brit. Med. Journ.*, London, 1888.

[3] *Int. Centralbl. f. Laryngol.*, 1906.

[4] *Brit. Med. Journ.*, London, 1906, November 17.

[5] *Lancet*, London, 1906, June 30.

We must consider, in the first place, what position the surgeon and patient are to assume during the operation, and we have to select a method of inducing anæsthesia. There can, I think, be little doubt that both operator and patient should adopt the sitting posture when at all possible. The former making use of forehead mirror and reflected light, places himself in the position he adopts for the routine examination and treatment of rhinological cases. A view of any part of the nasal septum can then be obtained by a suitable movement of the patient's head. To allow of this position, and to gain the co-operation of the patient during the operation, it is almost essential to give a local anæsthetic.

It may be argued that women and children cannot be expected to stand the strain to which they will be subjected if these methods are adopted, but in practice it will, I think, be found that only a small percentage will fail to do so. I have only failed in one case to complete the operation, this patient, however, a girl, æt. 17, would not permit me even to introduce a speculum into the nose the first time I saw her. In two other cases I had to allow the patients, one a girl, æt. 15, the other a young woman, æt. 24, to lie down during the operation, because the cocaine had made them feel very faint, and in one I used a general anæsthetic. It is therefore probably wiser to allow the recumbent position and a general anæsthetic when dealing with a very nervous subject.

An anæsthetic may be given locally in three ways: either by injection under the mucous membrane, or by application to the surface by massage, or simply by laying pledgets of wool soaked in the anæsthetic—a 20 per cent. solution of cocaine containing a few drops of adrenalin chloride solution (1–1000) against the septum. The last method, which is that adopted by Jansen, gives incomplete anæsthesia, and does not control the bleeding—in short, it is a method which could only satisfy a brilliant operator such as Jansen undoubtedly is.

To get a really satisfactory anæsthesia by the second method takes in my experience fully half an hour with the solution above mentioned, and is therefore tedious both to operator and patient. Freer, however, claims that by using cocaine crystals he can produce a sufficient degree of anæsthesia in about five minutes. If, however, the method by injection be adopted, a ½ per cent. solution of cocaine, containing 3 drops of adrenalin chloride solution (1–1000) in each drachm, being used for the infiltration, the anæsthetic action is more rapidly induced, is more profound, and lasts longer. Before injection, a 10 per cent. solution of cocaine should be applied to the site of puncture. I have found the Alvatunder syringe especially well fitted for carrying out the injection: the needle is pushed under the mucous membrane down to the cartilage, it being desirable to inject the solution below the perichondrium, about a drachm of the solution may be injected on each side. If there be a sharp ridge running parallel to the floor of the nose, it is advisable to inject some of the solution below the spur as well as above it, otherwise there may be pain and bleeding during the later stages of the operation. The solution should be injected close to the junction of the skin and mucous membrane, in order to avoid hæmorrhage after the first incision. This obviates the necessity of using the galvano-cautery instead of the knife for this purpose, a point on which Krieg and Zarniko lay great stress. Here the question may be put, is there no fear that the production of such profound ischaemia will tend to cause sloughing of the mucous membrane? The answer is in the negative, unless, indeed, there be much laceration of the flaps. With the method of examination and the position of the patient described above, every step of the operation can be followed in its entirety by the eye of the operator.

When it is decided, for reasons already mentioned, to give a general anæsthetic, the local injection of cocaine and adrenalin in solution should never be omitted, and ought to be carried out before the general anaesthesia is commenced. It is then unnecessary to plug the naso-pharynx. Narcosis is maintained during the operation preferably with Junker's inhaler. The recumbent position makes the removal of the lower part of the septum very much more difficult. Better illumination will then be obtained, as Freer points out, by the use of a forehead lamp instead of a reflector. The success of the operation and the length of time taken in its performance depend in no small degree on the thoroughness of the anaesthesia and of the ischaemia.

It has already been stated that a number of different incisions have been planned for this operation, though all authors are agreed in making it on the convex side of the septum. The incision which I have found satisfactory for all cases is a slightly curved one, beginning at the junction of the septum with the floor of the nose just within the vestibule, running upwards parallel with the free margin of the septum, and ½ cm. behind the junction of the skin and mucous membrane. This incision, which is made with a sharp tenotomy knife, and is carried into the cartilage, gives free access during the subsequent stages of the operation. I do not see the necessity for the reversed L and other methods devised by Freer for certain cases. His argument is that unless a large flap be turned up, it is impossible to obtain sufficient access to deeper parts. This has not, however, been my experience since I have adopted the method for removing bone which will be described afterwards. When the incision has been made, the edge of the mucous membrane along with the perichondrium must be scraped off the cartilage; for this purpose a fine elevator is well suited. The same instrument is of value in raising the flap off the edge of a spur, or in separating any part of the mucous membrane which is adherent to the cartilage as a result of previous operative procedures. Having once commenced the separation, it is easily continued by means of a blunt rasparatory, and of these Jansen's is by far the best that I have seen.

When the flap on the convex side has been thoroughly separated, the cartilage is incised in the line of and just behind the incision in the mucous membrane, and for the same extent. If a very sharp tenotomy knife be used, and the division is carried out in a slanting direction, there is not much fear of injuring the mucous membrane on the opposite side, and there is no necessity for putting the finger into the other nostril. The flap on the concave side is then raised with the elevator, the speculum being now introduced into the opposite nostril in order that the movements of the instrument below the mucous membrane may be guided. If the convexity is to the right, the rasparatory is held in the left hand and the speculum in the right; but when the convexity is to the left, the speculum is held in the left hand and the elevator in the right. After the mucous membrane has been thoroughly separated on the concave side, the cartilage can be removed; one blade of Killian's long nasal speculum is first introduced between each flap and the cartilage, the latter is then cut out with Ballenger's swivel knife. By a single sweep of the latter along three sides of a square, the direction being first upwards and backwards, then directly downwards, and finally forwards, almost the whole cartilage can be removed in one piece. A narrow rim of cartilage is purposely left along the roof of the nose to prevent subsequent sinking in of its tip.

Killian's speculum should now be laid aside, for although an excellent view is obtained by its use, there is not sufficient room between its blades to separate the limbs of a pair of forceps. I therefore use a speculum whose blades open in a vertical direction; the latter are short, as they are required merely to open the door, as it were, between the two flaps; on then inserting and opening the pair of forceps, the flaps are pressed apart, and the operator can see what he has to grasp. It is through adopting this method of removing bone that I find the one incision is amply sufficient for all cases. The forceps I have found most useful are Jansen's. Ritter's modification of Heymann's forceps are also of value. The speculum I use is known as Beckmann's.

When sufficient bone has been removed from the upper and back parts of the septum, the base must be attacked. There is frequently a spur in this region, and this may be nibbled away with Jansen's forceps, but it is more satisfactorily removed with hammer and gouge, and for this purpose, as a third hand is necessary, an assistant is required to wield the hammer. Now, to chisel through the bone on the floor of the nose, it is obviously necessary to raise the hand which is holding the gouge, but the bend on Killian's instrument has the effect of bringing the hand directly in the line of the surgeon's vision. To obviate this fault, my friend Dr. Wilson of St. Louis had a gouge constructed with the bend in the opposite direction to that of Killian's. When using this pattern of gouge the eye can follow all its movements.

Before making use of the chisel, the surgeon must satisfy himself that the mucous membrane and periosteum are separated down to the floor of the nose on both sides. The flaps are then separated by Killian's long speculum, and the projecting bone is chiselled away.

There is almost invariably some bleeding from the bone itself at this stage.

Finally, the operator must make sure that the whole of the deviated cartilage and bone has been resected, and that the flaps of mucous membrane when in apposition hang down as a vertical partition. In order to bring the flaps together, the patient should blow down each nostril separately while the other nostril is closed. On looking into the nose, the surgeon should now be able to see the middle turbinated body and the back wall of the naso-pharynx on each side.

No stitches are necessary if a perforation has been avoided, and no packing except a small strip of gauze applied to the site of the incision. The absence of packing saves the patient much discomfort. The gauze is wrung out of a solution of peroxide of hydrogen, a suggestion due to M'Bride, partly because of the hæmostatic action of the drug, and partly because the removal of the plug (after twenty-four hours) is less painful than when dry gauze is used.

Perforations are liable to be made on separating the mucous membrane from sharp spurs, on the first division of the cartilage and on removing bone, more especially if forceps are used instead of hammer and chisel to remove the bone at the base of the septum.

Perforations should be stitched with Killian's needle and horsehair; the loop of suture after transfixing both edges of the perforation is caught by a pair of fine-toothed forceps, and the needle withdrawn. The stitch is then tied and cut short. A self-holding speculum must be employed while inserting sutures: that known as Heffernan's is a useful pattern. For the stages of the operation when no special speculum is mentioned I use Hartmann's pattern.

One more question arises. Should the hypertrophy of the inferior turbinated body, which is commonly to be found on the roomy side of the nose, be removed at the same sitting as the resection of the septum? I do not now do so, for two reasons: first, I have found a tendency for an adhesion to form during the process of healing between the raw surface of the inferior turbinal and the septum, and secondly, because in one case I have seen a severe secondary hæmorrhage from the turbinal necessitate tight packing of one side of the nose, and thus throw severe strain on the weakened septum. I therefore think that interference with turbinal hypertrophy should be deferred for at least three weeks; it may then be found unnecessary.

Occasionally a perforation will be made in spite of every care, but for the patient it is a matter of little concern; it merely causes some delay in the healing. I have not experienced in my practice any complication apart from those already mentioned.

The time taken for the operation varies from fifteen minutes in a simple case to some forty-five minutes in a very difficult one—twenty minutes is about the average: this refers only to cases operated on under a local anæsthetic. If a general anæsthetic be employed, more time may be required.

The functional result was perfect in all my cases, with one exception. In that case, already mentioned, the patient, a girl, æt. 15, had to be operated on in the horizontal position. As she was restless, the hæmorrhage was troublesome, and I failed to remove the lower part of the septum satisfactorily; the breathing, however, improved so considerably that it did not seem justifiable to advise a second operation.

Finally, I should mention a case in which the deviation was bow-shaped, with in addition a small spur along the floor of the nose. In this case, at Dr. M'Bride's suggestion, I removed the deviation, but left the spur. The functional result was perfect; the patient, however, was so far a gainer in that the operation only lasted ten minutes instead of the twenty minutes it would otherwise have taken.

THE TREATMENT OF GALL STONES IN THE GALL BLADDER AND CYSTIC DUCT.

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In this clinical paper I propose to set myself certain definite limitations, and shall concern myself not to be caught out of bounds except as wider excursions may be necessary incidentally for purposes of elucidation of the main points at issue. I have not chosen the subject of the treatment of gall stones in the gall bladder and cystic duct because the most important aspect of the gall-stone question is therein contained. Indeed, the contention might be sustained, that although 96 per cent. of all gall stones concern the gall bladder and cystic duct, the remaining 4 per cent. found in the hepatic and common ducts not only furnish as large a number of surgical crises, but entail as great an amount of human suffering, and certainly place human life more frequently in jeopardy. But I have placed the above self-limitation because it is impossible to deal with the whole subject in one short paper, and because I happen to have had quite recently a series of cases in each of which I have been called upon to decide on the spot what line of treatment was in the best interests of the patient under operation.

In attempting a deferentially critical and judicial appraisement of the present-day status of the subject, as evidenced in the writings and teachings of modern authorities, I have endeavoured to preserve a perfectly open and discerning frame of mind, though I cannot hope to have entirely suppressed my own individual opinion, and indeed have not seriously tried to do so. That there is a demand for some such judicial estimate is sufficiently evident, as one observes the wide divergencies of opinion encountered in such a course of reading as is required to attain a familiarity with the whole subject, and the writer can but regret that no single individual, much less himself, possesses such absolute soundness of judgment as to be competent to speak the last word in mapping out a route to be invariably followed under given conditions in cases of gall stone where surgical intervention is indicated.

Though gall-stone surgery has but recently reached its majority, so lusty is the growth of all branches of the art since Lister charted the lines of possible progress, that the mass and volume of writings is so great to-day that the most zealous investigator may well plead fatigue before he has covered the whole ground within his view.

Greig Smith states that from the date of Petit's work in 1733 until Langenbuch introduced the operation of cholecystotomy in 1882, gall-stone surgery practically stood still. Hence, practically the whole of what constitutes the modern status of this branch of the art has been achieved since that date. When the names of Langenbuch, Tait, Fenger, Mayo Robson, Greig Smith, Kehr, Bevan, Mayo, and Watson Cheyne are mentioned in terms of commendation, one cannot but feel that so many others perhaps equally entitled to credit have been omitted, that it would have been less invidious and perhaps more generous to have remained silent.

But, while I have determined to avoid dealing with the symptoms, diagnosis, and pathology of the subject, I feel that I may be permitted to state in somewhat oracular fashion certain facts so universally accepted as to have attained the status of truisms in gall-stone surgery. Such statements are useful as affording in a few words a substantial platform on which one may base one's argument in advocating this or that line of treatment in any stated case.

The following axioms gleaned from the accumulated experience, wisdom, and investigations of various authorities may be propounded:—

That all stones found in the gall bladder and cystic duct are the progeny of the gall bladder itself. Upon this fact is based one of the most cogent and logical arguments in favour of cholecystectomy. That the invariable precursor of gall-stone formation is inflammatory or catarrhal disease of the mucous membrane; that such inflammation is bacterial in origin; that the offending germs are usually the typhoid and colon bacilli; and that such germs may reach the seat of disease either by travelling backwards through the ducts, or by being directly excreted into the bile from the blood of the portal vein. That these bacteria act by causing an increase of mucus which forms the colloid material which cements together the crystalline bile salts and pigment, and that they may be concerned in the precipitation of these salts. This mucus also produces the necessary stagnation by greatly retarding the flow of bile. That the stones tend to occur in crops, the individual members of which are of the same age and chemical composition, and approximately of the same size, shape, colour, and consistence. That when there are present stones varying widely in these characters, particularly as regards size, they represent different crops and different attacks of cholecystitis. That the tendency of all stones is to increase in size by accretion, even when no cholecystitis is present. Indeed, white stones of pure cholesterin may develop and grow in the gall bladder even when obliteration of the cystic duct prevents the entrance of bile. That nevertheless repeated attacks of cholecystitis may occur without being accompanied by stone formation. That when once formed gall stones cannot be dissolved by any medicinal agents, nor can they, when of any considerable size, be purged out of the gall bladder and ducts by any such remedies as olive oil or glycerin. That the existence of gall stones marks a departure from health, and that their presence may lead to colic, rupture, cancer, cholecystitis of varying degrees of intensity, possibly culminating in gangrene, or to perivesical adhesions of a serious and painful character. That nevertheless in many cases the gall bladder has been found packed with gall stones, the cystic duct obstructed or obliterated, and the gall bladder rendered functionless, without giving rise to a single recognisable symptom during life. That the gall bladder is not essential to the economy of the digestive system is attested by the facts above stated: by the fact that all animals of the equine class (*solipeds*) are naturally deficient in that organ; and that when it has been removed in the human subject no appreciable disability has resulted, though the hepatic ducts undergo a dilatation which is probably compensatory in character. That the value of bile in the economy of the human system resides in its qualities as an excretion rather than as a secretion is attested by the fact that even when a permanent external fistula diverts it from the digestive tract, health is not materially affected; whereas its retention in the system invariably results in death from slow poisoning (cholæmia).

It being established that all efforts to relieve the condition of gall stones by medicinal means are futile, it follows that if they are to be dislodged at all, the task must be achieved by surgical means. The measures for relief that have been advocated by different authors are so rich in number as to be almost embarrassing, and may be thus enumerated:—

1. *Cholelithotomy* or "the ideal operation," namely, opening the gall bladder, removing the stones, closing the wound by accurate suturing, dropping the organ back, and closing the abdominal wound without drainage.

2. *Cholecystostomy*, in which, after the stones are removed, the gall bladder is stitched to the abdominal wound and drained either temporarily or permanently.

3. *Cholecystectomy*, in which the gall bladder with its contained stones is removed intact with or without temporary drainage of the abdominal cavity.

4. *Cholecyst-enterostomy*, or the formation of a bimucous fistula between the gall bladder and some part of the intestinal tract.

5. *Cholelithotrity*, by which a stone found to be irremovable is broken into small fragments either by crushing *in situ* with padded forceps or the fingers, or by a needle which is made to pierce it repeatedly.

6. A deliberate policy of *non-interference*.

It is impossible, by the aid of any diagnostic means at present within reach, to predicate with any degree of accuracy what condition will be found when the abdomen is opened, and hence the surgeon must approach the operation with a perfectly open mind but with all his senses alert. He must not permit his judgment to be swayed by any predilection he may have in favour of some particular operation, nor must he allow his ambition to do something brilliant overshadow his obligation to secure that the best interests of the patient must always be supreme.

It seems an extraordinary statement to make, but some experience and a well-considered view of the facts appear to warrant the assertion, that Mayo Robson, by simply advising that a 3½ in. sandbag should be placed under the patient at the level of the liver during the operation, has given an impetus to gall-stone surgery that probably marks an epoch, and has literally widened the field for operation on the biliary passages to an extent that is fully appreciated by those only who have experienced the difficulties attending some of the operations in this region. This happy expedient—very obvious when once attention is drawn to it—brings into the list of operable cases many conditions which would otherwise be wholly inoperable, and also enables the surgeon to perform the ordinary operations with so much greater ease and exactness, that results are infinitely better than before this method was used. By thus causing the lower dorsal region to arch forward, the advantages of a double-ended Trendelenberg position are secured, and the lower outlet of the bony thorax, which lodges the liver and its ducts, is thrust forward more directly towards the operator.

On opening the abdomen, a careful and thorough examination of the gall bladder and biliary passages must form the basis of a decision as to the procedure to be followed, and the operator should have very clear-cut ideas as to methods and a large share of clinical acumen so as to be able to reach a decision on the spot without undue loss of time.

The task of assigning the legitimate place of each operation in the field of gall-stone surgery of the present day must now be undertaken, and in doing so it must be remembered that while the first and paramount duty of the surgeon is to save life, there yet devolves upon him a second duty, only less important, of minimising suffering, economising time of healing, and leaving the patient after recovery in a condition as nearly approaching that of normal health as possible.

1. *Cholecystotomy* or *cholelithotomy* (the "ideal operation"). —This plan of opening the gall bladder, extracting the stone, and then stitching up the wound entirely intra-peritoneally without drainage, was the method used in what was perhaps the first cholecystotomy ever deliberately attempted. To Bobbs of Indianapolis, in 1867, is due the credit of this procedure, which was a bold one in those days, but which, though he used but a single suture, was fortunately followed by complete success. Gross, some years later, repeated the operation, but with a less happy result.

Indeed, so little was thought of this method, that Greig Smith in his admirable work on "Abdominal Surgery" (1896) refers to the proceeding as follows: "The plan of complete intra-peritoneal closure of the opening in the gall bladder may be dismissed in a word." He then refers to the cases of Bobbs and Gross above mentioned, and continues as follows: "These cases proved that intra-abdominal closure may be successful, and some surgeons continue to favour this proceeding, calling it by a somewhat gratuitous assumption of excellence the 'ideal operation.' It is not ideal in the sense of saving life; the total mortality is increased by 2 per cent. by this proceeding alone. The walls of the gall bladder when healthy are too thin to be satisfactorily sutured; when thick they are inflamed and cannot be trusted to heal kindly. The risk of extravasation is far too great for the advantage to be secured, and therefore primary suture is not to be recommended. On these grounds the most experienced and the most successful operators, such as Tait, Robson, Keen, and Meredith, are all against the proceeding."

Thus spoke a decade ago one who was abreast of the times, and who could not with any degree of fairness be deemed to be wanting in courage, and yet, so rapid is the advance of surgery, one feels no lack of confidence in asserting that, if that discreet and judicious surgeon were alive to-day, he would be found in the ranks of those who teach and practise this operation as a matter of course in a certain very small and narrowly restricted class of suitable cases.

It need scarcely be said that a case, in order to qualify as a candidate for the "ideal operation," must present "ideal" features of a character favourable to the surgeon's design. Briefly stated, such features may be enumerated as follows: The gall bladder—except for the presence of stone—must be quite healthy and free from catarrhal or perivesical inflammation; a bladder wall either too thick or too thin would be unfavourable. The bile must be thin and free from an excess of mucus. The cystic duct must be patent, or if a stone be lodged in it, this must be capable of being pushed back into the gall bladder without injury to the duct or to the neck of the viscus. The hepatic and common ducts must of course be free from stone, and there must be no jaundice present. The number of stones must be small—not more than two or three. They must be freely movable, but within limits mere size does not constitute a contra-indication. A viscus containing two or three large stones and a multitude of small ones would be regarded as an unsuitable case. Generally speaking, the number and character of stones present cannot be ascertained until the bile is withdrawn by aspiration. The gall bladder must not be contracted; indeed, if it be moderately increased in size, particularly in the direction of elongation, as it usually is where it is the host of a small number of freely movable stones, the operation is facilitated. A limited degree of inflammatory adhesions in the neighbourhood would scarcely be a contra-indication, but as a matter of fact in cases which fulfil the above conditions such adhesions are rarely present. The general health and recuperative powers of the patient must also be in a satisfactory state. Such cases are illustrated by the following records:—

Case 1.—Referred by Dr. F. W. Stevenson, Bradford.—Mrs. J., æt. 40.—*Operation*, October 26, 1904.—Had suffered from repeated attacks of hepatic colic. The attacks were not severe in type, and were unaccompanied by jaundice. Subsequently she developed appendicitis, and was operated upon in an interval for that disease. The incision was purposely made a little higher than usual, in order to permit of examination of the gall bladder. After the appendix was removed, the gall bladder was examined and found to contain a single tuberculated stone. The viscus was so elongated that its fundus with the stone enclosed could be brought without much difficulty into the wound made for the appendix operation. This wound was, however, closed, and a second opening made over the gall bladder. This was found to be free from adhesions, the cystic and common ducts were healthy, and on aspiration the gall bladder was found to contain thin healthy bile without excess of mucus. The "ideal operation" was performed without difficulty, using the technique which will be described presently, and the abdomen was closed without drainage. The stone was about $\frac{3}{8}$ in. in diameter, rounded, tuberculated, and composed of intensely black pigment. Recovery was prompt and perfect.

CASE 2.—Referred by Dr. Fotheringham.—Mrs. H., æt. 45.—*Operation*, February 22, 1905.—Repeated attacks of gall-stone colic, usually severe, and marked by considerable dilatation of the gall bladder but without jaundice. Health otherwise good. On opening the abdomen, the gall bladder—considerably enlarged—was found to contain two rounded stones almost exactly similar in size, shape, and colour. Each was $\frac{3}{4}$ in. in diameter, with a tuberculated surface, and was marked by four imperfect facets. The cystic duct was free from stone, and the viscus contained healthy bile. No adhesions were present. The "ideal operation" was performed, and a recovery complete and quite uneventful followed.

CASE 3.—Referred by Dr. W. P. Caven, Toronto.—Mrs. T., æt. 36. —*Operation*, December 11, 1906.—Had repeated attacks of colic, accompanied by intermittent jaundice. Since June last attacks have been very severe, and there has been considerable loss of weight and deterioration of general health. A single large gall stone in a rather small gall bladder, and another equally large occupying the second portion of the common duct, were found. There were a few adhesions which were easily separated. The gall bladder was aspirated and washed out. A purse-string suture was placed in position (as described under the head of technique); the stone was pressed against this part by the left hand which grasped the gall bladder; an incision was made upon it, and the stone squeezed gently through it. Then the purse-string suture was tied, the edges of the incision being infolded. A second infolding was done by a continuons Halsted suture, care being taken not to pierce the mucous membrane.

The stone in the common duct, which was considerably dilated, was removed by incision without difficulty, and the duct was very carefully stitched by two rows of continuous catgut sutures. A small rubber drainage tube surrounded by gauze was then placed down to the seat of operation from the abdominal wound, the remainder of which was stitched with continuous "corkscrew" sutures. Thus the "ideal operation" was done both on the gall bladder and the common duct, except that a precautionary drain was placed down to the area of operation. The patient had no bad symptoms whatever. The tube and gauze were removed on the fourth day, and the wound was entirely healed by the eighth day, when the sutures were removed.

2. *Cholecystostomy.*—Explicitly excluding the formation of a permanent fistula in case of irremediable obstruction of the

common duct from neoplasm or otherwise, it may be stated that this operation involves the creation of a fistula opening upon the skin surface which is designed to be temporary only. It is undertaken when after removal of the stones the gall bladder is deemed to be in too unhealthy a state to be closed by suture, and yet is not so badly diseased as to preclude the hope that a period of drainage may result in its being completely restored to functional health. The question hinges largely upon the condition of the cystic duct, since unless that passage can be rendered sufficiently patent to permit of the free ebb and flow of bile, there is no object served by declining the more radical operation of cholecystectomy. If at the time of operation the gall bladder is found to be filled with viscid mucus, usually colourless, though sometimes deeply bile-stained, it is highly probable that the cystic duct has been occluded for a considerable period of time. Such occlusion may be due to either—(1) Impaction of a stone within the valve of Heister at the neck of the gall bladder, or in the course of the duct; (2) to inflammatory obliteration or stricture; (3) to the pressure of cicatricial adhesions; or (4) to neoplasm. Of these various causes of obstruction the only one which offers any reasonable hope of proving remediable is the first, and even here the prospects are not by any means brilliant. However, when the stone can be easily dislodged by being pushed back into the gall bladder, or even when it is necessary to incise the duct to remove it, a cholecystotomy may be done, provided the patency of the duct to its junction with the common duct can be demonstrated either by passing a probe along it, or by squeezing a few drops of healthy bile back from the parent duct.

A gall bladder packed completely full of stones is in all probability hopelessly diseased, and as such an organ is frequently so greatly contracted that its fundus could only be brought to the abdominal wall with difficulty, the major operation of cholecystectomy is to be preferred.

A moderate degree of suppuration does not necessarily contraindicate cholecystostomy with a hope of recovery, but this operation is still more strongly indicated when the inflammatory process is of a more virulent type, not in the expectation of functional recovery, but because the major operation of cholecystectomy under these circumstances would involve too great a danger to life.

Advocates of this operation in preference to cholecystectomy, must, however, be prepared to meet the objection that even when the happiest results are obtained by the final closing of the fistula and the restoration of the function of the organ, the presence of the adhesion of the fundus to the abdominal wall frequently gives rise to considerable pain and discomfort. On the other hand, when the cystic duct fails to meet the hopes of the operator by remaining impervious, not only do the adhesions above mentioned obtain, but there persists a permanent fistula which perpetually discharges a vexatious though non-irritating mucus. No doubt the explanation of the painful character of the adhesions is that, as they are formed while the patient is in the recumbent position, they are pressed upon and stretched when the resumption of the erect posture permits the liver to rotate forward and downward by its own weight. Such adhesions also doubtless interfere to a limited extent with the free downward movement of the diaphragm in inspiration.

Case 4.—Referred by Dr. C. J. Wagner.—Mrs. K., æt. 34.—*Operation*, November 27, 1906.—Her first severe attack of biliary colic was at the age of 18. Had attacks occasionally for several years. During the last year they have been more frequent. Inflammatory symptoms came on about six days before operation, and pain was intense. The gall bladder could be plainly felt, and was very tender on pressure. The pulse ran about 100, and the temperature ranged from 100° to 102° F. Some slight chills and perspiration occurred irregularly, and there was loss of appetite, coated tongue, and constipation.

On opening the abdomen, the gall bladder was found to be considerably distended and very tense—so tense, indeed, that it was impossible to tell by palpation whether it contained stones or not. There were present numerous recent adhesions. Aspiration and washing out were practised before the bladder was opened, and when the bladder was emptied it was found to contain one large stone, while another was lodged about the middle of the cystic duct. The contents of the bladder were muco-purulent but distinctly bile-stained. The large stone was removed, but that in the cystic duct could not be felt by the finger in the gall bladder, nor could it be worked back until the duct was gently dilated with forceps. The opening in the gall bladder was stitched to the abdominal wall, and a drainage tube was passed through it up to the cystic duct. As a precautionary measure, in view of the septic character of the bladder contents, a gauze drain was also placed outside the gall bladder. The latter was removed on the third day, but the drainage of the gall bladder was continued for two weeks, when the bile seemed perfectly healthy. The fistula healed in another ten days, and the patient has since remained well.

3. *Cholecystectomy.* — This operation has in recent years acquired a very considerable vogue, and has been exploited by certain writers with a zeal not always tempered with discretion. One such strenuous advocate quarrels with nature to the extent of stating that the value of the gall bladder as a reservoir for bile is *nil*, and classes it with the vermiform appendix as a functionless organ. Such a position, while perhaps extreme, is not unsupported by facts that may have been cited in an earlier part of this paper; but those are on safe ground who argue that an organ so constantly present, observing so unvarying a routine of operation in health, so generously supplied with blood, possessing a mucous membrane infinitely more elaborate than that of the urinary bladder, and provided with such a curiously contrived valvular mechanism in its neck and duct, has not been placed in the human

body without some useful purpose to serve. Moreover, it is not consonant with the traditions of good surgery to remove an organ which is healthy or capable by treatment of being rendered so.

As has already been observed, one of the most potent arguments for the removal of the organ is the fact that its ablation, by removing the breeding-place of stones, practically puts an end to cholelithiasis in the subject of the operation, since the instances of gall stones being formed in the liver and hepatic ducts constitute perhaps not more than one-tenth of 1 per cent. of all cases of gall stones.

On the contrary, it may be stated that an invariable contra-indication to this operation is the occurrence of jaundice, not alone because hæmorrhage is apt to be troublesome, and may even prove fatal under these circumstances, but because jaundice indicates obstruction of the common duct, which may or may not be removable. If the former, the cholecystectomy may well wait until the re-establishment of the flow into the duodenum is attested by the disappearance of the jaundice; if the latter, the gall bladder affords an invaluable route by which the poisonous bile may be drained away from the system. But if the common duct be patent and healthy, and there is no evidence of disease in the head of the pancreas or other viscera, the argument that the gall bladder should be retained, because at some obscurely remote period cancer or some other obstruction might possibly occlude the common duct, is an extremely far-fetched and feeble one.

Having thus viewed the question on broad lines, it is convenient to cite the indications that may be best met by cholecystectomy. Possibly the strongest indication is the permanent occlusion, or hopeless disease or injury of the cystic duct. In these circumstances, not only is the gall bladder useless, but it is a constant menace to the patient, from the fact that it may at any time become the seat of cancer, of suppurative, phlegmonous, or gangrenous inflammation, or may be the occasion of perivesical adhesions, which interfere with the functions of adjacent organs.

When the gall bladder is shrunken, atrophied, and packed with stones, or, on the other hand, when it is enlarged, thickened, and clogged with stones and viscid mucus, and has lost its communication with the common duct, not only is the operation of cholecystectomy indicated, but it is incomparably the easiest method of dealing with the problem, and the period of convalescence will be immeasurably shortened.

In cases of phlegmonous or gangrenous inflammation occurring with stone, this operation would certainly be indicated were it not for the fact that a higher mortality would result than from the less disturbing operation of drainage. After the inflammation has subsided, however, if a sinus persists indefinitely, the major operation may very properly be undertaken. The same remark applies to those cases of stone which have been treated by cholecystostomy, in which a sinus persists, which discharges mucus, and not bile. There is, of course, but little danger that stones will re-form in such a viscus in the absence of bile, but the constant discharge is an annoyance, and the presence of such a gall bladder tends to create undesirable adhesions in its neighbourhood, and invites the development of cancer.

Case 5.—Referred by Dr. R. A. Stevenson, Toronto.—Mrs. E., æt. 48.—*Operation*, December 28, 1906.—Had first attacks of colic eighteen years ago. They occurred at intervals of from four days to three weeks, and prevailed for about a year. She was then free from attacks for three years, after which they returned, though with less severity and frequency, until a year ago. During the past year she has had typical biliary colic every two to four weeks, and has been greatly affected in her general health. On opening the abdomen, the gall bladder was found to be considerably enlarged, but was not tensely distended. Aspiration and washing out were done, and it was observed that the fluid, though distinctly bilious, was much thickened with mucus, and that there were present large numbers of minute masses of intensely black pigment. One very large stone was felt, and a cholecystectomy was performed without difficulty, and without any soiling of the abdomen. The abdominal wound was stitched up without drainage, and recovery was uninterrupted. After healing was complete, it was found that the scar was exactly 3 in. long. That such an operation could be done through such a small opening, was due to the fact that the abdominal walls were unusually flaccid and elastic. On opening the gall bladder—in addition to the large stone already described, which was about 1½ in. in its longest diameter—several dozen masses of black pigment, from the size of a pin head to that of a pea, were found.

In this case the attacks of biliary colic were doubtless caused by passage of the small stones, and not by any engagement of the large one. Three weeks after the operation, this patient had an attack which Dr. Stevenson regarded as billiary colic. Doubtless one of the small stones had reached the common duct before the operation was performed, and the pain was caused by its efforts to escape into the duodenum. She has had no recurrence since, and is now in good health.

Case 6.—Referred by Dr. John Caven.—Miss E. M., æt. 52.—*Operation*, January 10, 1907.—Until three years ago the patient had enjoyed unusually good health; at that time, however, symptoms came on which were attributed to severe indigestion. Two years ago the attacks became typical of biliary colic, and became very frequent. She also had three attacks with symptoms which pointed very strongly to disease of the appendix. Operation was directed first to the appendix region, and a vertical incision in the linea semilunaris was made with a view to examining the gall-bladder region at the same time. The appendix was found to be obliterated to the condition of a thin fibrous cord, with a bulbous extremity, and was wrapped around the cæcum in such a way as to form a constricting band. Dense adhesions were also present in the neighbourhood. After removal of this organ, the gall-bladder region was examined, and that viscus found to be contracted and completely packed full of stones.

The incision was extended upwards to the margin of the ribs, and then obliquely towards the ensiform cartilage, as recommended by Mayo Robson.

The cystic duct was extremely short, and a stone was lodged in it so close to the common duct that it was with difficulty that an amputation could be made without injuring the latter. The abdominal wound was stitched up without drainage, and recovery was uninterrupted.

Case 7.—Referred by Dr. John Caven.—Mrs. B., æt. 39.—*Operation*, January 11, 1907.—This patient had had repeated attacks of appendicitis, the first occurring six years ago. Latterly she has been the subject of attacks of gall-stone colic of varying degrees of severity, and lasting from half an hour to eight or ten hours. They generally came on in the evening, and did not seem to be necessarily connected with taking a meal. The pain was extremely severe in the epigastric region, and radiated around the back between the shoulder blades. In this case the primary incision was made in the appendiceal region, as the most prominent symptoms of the patient pointed to disease in this region. The appendix was found to be densely fibrosed, and both it and the cæcum were enwrapped in dense old adhesions. After the appendix was removed, the hand was passed up to the liver region, and the gall bladder was found to be extremely tense, though small, and filled with a considerable number of calculi. The appendix wound was then closed, and a separate incision made over the gall bladder, which was removed without undue difficulty. The cystic duct was found to be completely occluded by a stone lodged within the valve of Heister. The patient made a perfect recovery, without any untoward symptoms.

Case 8.—Referred by Dr. H. J. Hamilton, Toronto.—Mrs. S., æt. 65.—*Operation*, January 17, 1907.—The patient had suffered from indigestion for ten or fifteen years, but the first attack of hepatic colic occurred four years ago. Since that time attacks have been present every four to eight weeks, but latterly have been more frequent and more severe. The pain was of an agonising character in the region of the liver, the back, and the right shoulder, and the attacks were accompanied by nausea and vomiting, but never with jaundice. She has taken large doses of sweet oil, with a view to getting rid of the gall stones, but without effect. At the time of operation the gall bladder was found to be filled with mucus, in which were two quite large and a considerable number of small stones. One of the large stones was lodged within the valve of Heister, completely occluding the outlet of the bladder. Cholecystectomy was performed, and healing took place by first intention, without any untoward symptoms.

4. *Cholecyst-enterostomy.*—Bearing in mind the limitations of this paper, which excludes any considerations involving occlusion of the common duct, the question of cholecyst-enterostomy may be dismissed in one word. The only possible reason for this operation would be to obviate an external mucous fistula in a case where after cholecystostomy the cystic duct remained impervious, and one cannot conceive of any such condition which would not be

met more safely, more easily, and better by a removal of the gall bladder.

5. *Cholelithotrity* (crushing or needling stones *in situ*).—This slovenly makeshift probably was justifiable some years ago, but, fortunately, owing largely to Mayo Robson's sandbag, the whole of the bile passages are now so readily accessible that such a proceeding can seldom be sanctioned. If a stone be found to be so firmly impacted in the cystic duct that it cannot be moved back into the gall bladder, it is more than probable that the duct is irreparably diseased, and in this case removal of the gall bladder and its duct is the only rational treatment. If, however, some obstruction of the common duct demands the retention of the gall bladder for purpose of drainage, any stone impacted in the cystic duct should be removed by cutting down upon it from the outside. A clean cut thus made will produce much less real damage to the duct than the crushing of a stone by forceps, howsoever well they may be padded, since it is quite certain that any force which will crush a gall stone will be more than sufficient to crush and lacerate the mucous membrane between it and the forceps on *both* sides of the duct.

The needling process is but little less damaging, and moreover in both cases the sharp, irritating fragments are still left to be got rid of by the patient in a series of sweating agonies. Neither is it by any means certain that these fragments will be propelled into the common duct at all, for the mucus that collects in the gall bladder on the distal side of an impacted stone furnishes the worst possible vehicle, and it is seldom that under these circumstances there is any free flow of bile through the duct. Furthermore, it is not at all certain that the flow of bile into the gall bladder may not carry some of these fragments into that organ instead of into the common duct.

6. A policy of *non-interference* may well be entertained when gall stones are accidentally discovered (as, for example, during an abdominal operation) to be present in a patient who has reached an advanced age without having suffered inconvenience from their presence. In a younger person, however, who is otherwise healthy, the gravity of an operation for their removal must be weighed against the dangers of the occurrence of cancer, suppuration, and the formation of perivesical adhesions. Greig Smith held that we have no right to meddle with gall stones unless they give rise to serious discomfort or danger. Other authorities hold the opposite view, and much must be left to the judgment and discretion of the individual surgeon. Innocuous gall stones are properly in the same class as fatty tumours, exostoses, wens, and warts, which the judicious surgeon will let alone in elderly persons who value a comely appearance less than ease, comfort, and safety.

Conclusions.—1. The operations of crushing or needling the stones *in situ*, when lodged in the neck of the gall bladder or the cystic duct, should, it appears to me, be consigned to the limbo of the barbarous and the obsolete. Any stone which is sufficiently accessible to be attacked by a needle or a pair of forceps can be reached by a knife, so that an opening sufficiently large to permit of delivery of the intact stone can be safely made. Even when a stone is broken up there is no assurance at all that its fragments will be got rid of through the ducts. On the contrary, they may remain lodged against the soft, clinging mucous membrane, and grow rapidly. In any case, repeated agonising attacks of hepatic colic are almost inevitable before they are finally cast out of the system.

2. When there is no obstruction in the common duct, there seems to be no place in surgery for the operation of cholecystenterostomy, since in the only other condition in which it might be considered, namely, obliteration of the cystic duct, cholecystectomy is vastly preferable.

3. Cholecystostomy, either as a temporary measure to drain a gall bladder which is in a state of inflammation, or as a permanent means of conducting poisonous bile out of the system in cases of obstruction of the common duct, will doubtless always maintain a position in surgery, but the field which was formerly almost exclusively occupied by this operation is now becoming noticeably encroached upon by the more radical measure of cholecystectomy.

4. Among the various plans of treatment considered there are two which stand out pre-eminently as affording results which are immeasurably superior, when successful, to those obtained by other methods. These are cholelithotomy, or the "ideal operation," and cholecystectomy. A typically good result in either of these operations leaves the patient at the end of a week with the cause or results of disease completely removed, the abdominal wound perfectly healed, and all at the expense of the least possible amount of distress, anxiety, suffering, and time. Hence, under proper conditions, these are certainly the operations of choice. The field for the former operation will always be narrow, though with improvements in technique, and (in cases where any doubt whatever is entertained as to the accuracy of the suturing) with the addition of a precautionary drain down to the seat of operation, it is certainly entitled to a better standing than was accorded to it by Greig Smith in 1896.

Cholecystectomy appeals strongly to the modern surgeon by reason of its radical character. Certainly to be able to remove all the stones present at the time of operation, and by the same act to remove the breeding-place of such stones, is an alluring prospect. Provided always that the common duct be patent, and particularly if the cystic duct be occluded, cholecystectomy must at the present day be ranked as a major operation with a high degree of utility.

TECHNIQUE.—In regard to technique, little need be added to the directions given in copious detail by many authorities, but I venture to present at some length a few devices which I have not seen described, but which I have used in my own practice with advantage. In case I be found to describe some method which has already been featured by some other writer, I present my apologies beforehand, and certainly desire to claim no originality that is not universally and spontaneously granted. With this understanding even a repetition of some useful ideas may not be amiss.

Washing out the gall bladder before opening. — It has been mentioned in an earlier part of this paper that it is usually difficult or impossible to make out the exact condition of the gall bladder and its contents without first evacuating the fluid which it may contain, and I have found much satisfaction in a number of cases from following up such evacuation by a thorough washing out of the viscus before proceeding with any operation which may be determined upon. Whether cholelithotomy—the "ideal operation"—cholecystostomy, or cholecystectomy be chosen, it is a great comfort to the surgeon and an additional safeguard to the patient to have the ofttimes septic contents of the gall bladder replaced by an aseptic or antiseptic fluid. One encounters cases, of course, in which the viscidity of the contents is such as to resist all available powers of aspiration. Fortunately, such examples are usually sterile. But, on the other hand, in the bulk of cases the fluid is not of such viscidity, and whether it is merely bile, variously modified, or pus, it is rarely aseptic, and is, moreover, of such a consistence as to be easily drawn off by a good aspirator.

The process of washing-out is carried out as follows:—A two-way or Y-shaped needle or cannula is chosen about the size of a No. 3 catheter. If such be not available, a Y-shaped glass tube is attached at very short range to an ordinary aspirating needle. One branch of such Y leads to a reservoir at an elevation of about 2 to 3 ft., while the other branch is connected by non-collapsible rubber tubing to a large aspirating bottle placed slightly below the level of the patient. In order to minimise the friction of drawing thickened bile or pus through long lengths of rubber tubing, I have found it most useful to insert a small flask fitted with a perforated rubber cork in the course of the aspirating tube as close to the needle as possible. This intercepts and dilutes any thickened fluid, and prevents blocking of the aspirating tube. If desired, the first drawn fluid may be emptied out of this flask by momentarily uncorking it.

Before inserting the cannula, a suture of fine catgut, No. 1, chromicised, is inserted in purse-string fashion—not circularly, however, but in two parallel lines—running in the direction of the length of the gall bladder. These two lines should not be more than about $\frac{1}{8}$ in. apart, and the loop at one extremity and the two ends at the other should be left long so that the assistant can steady the organ by making traction, using both hands on the loop and the two ends of the suture. He can also, by means of these, make pressure upon the needle so as to prevent escape of fluid alongside, and there is a further use for this suture in closing the wound by tying rather loosely if the wound is to be stitched up, but quite tightly if a cholecystectomy is contemplated. Having packed sponges around the area, the needle is now plunged into the gall bladder, and the tube leading to the aspirator is opened. As soon as the gall bladder has been nearly emptied, the operator pinches the tube leading to the aspirator and releases the compression on the tube connected with the reservoir. This permits the gall bladder to fill up with the fluid from the reservoir. Again he shifts the compression from the aspirator tube to the reservoir tube, and the fluid is once more drawn out into the aspirating vessel. This process is repeated as often as the operator deems requisite, and thus the bile or pus is thoroughly washed out of the organ before it is opened. By this method the gall bladder can be washed out five or six times in one minute.

It becomes possible to make a thorough examination of the gall bladder and the cystic duct only when the viscus is emptied of its contents by the aspirator. If the cystic duct is found to be healthy and the gall bladder to contain a limited number of stones, the operation of *cholelithotomy* or the "ideal operation" is indicated. The surgeon grasps the gall bladder with his left hand and presses the stone or stones up to the region in which the purse-string suture is inserted. A deliberate cut is then made upon the stone, which is made to press against the wall of the bladder between the lines of the suture. An incision is then made down upon the stone, which is squeezed up through the opening and thus removed. It is important to make the incision sufficiently free to allow of the escape of the stone without any laceration of the edges of the cut, and, since the gall bladder is practically incapable of stretching, the incision must be nearly as long as half the circumference of the stone. As soon as the stone, or stones, is removed, the purse-string suture is tied so as to close the opening. This produces a degree of puckering of the wall of the viscus at that point, but secures a very good coaptation of the edges of the incision, which are slightly turned inwards. The suture should not be tied with a strangling degree of tightness, as this would have an injurious effect on healing. Another row or two rows of sutures may be inserted so as to fold the gall bladder over this packed area, and the method of suture of Halsted, by which the needle is passed through the serous coat and part of the fibrous coat, parallel to the one and not at right angles to it as in Lembert's suture, is strongly to be recommended. This suture is a continuous one, and must not be tightly strained. On the other hand, the apposition of the surfaces must be secured by gently folding in of the lines of suture rather than by using the suture to drag the parts forcibly together. If these precautions are observed, a very good line of apposition may be attained in a few moments. It certainly requires some delicacy of handling and some skill in suturing to thus stitch up a healthy gall bladder, but I cannot agree with Greig Smith that a gall bladder in a state of health, particularly when emptied of its contents, is too thin to admit of accurate suturing. It must be remembered that the main coat of the gall bladder is fibro-membranous in character, and thus affords a very good holding-ground for sutures. It is true that its submucous coat is lamentably ill-developed, and consequently it is not easy to avoid injuring the mucous membrane. Such a wound, however, would be most disastrous, and hence the great care that must be taken in applying these sutures. The material for the sutures should be fine chromicised catgut, No. 0 or No. 1. This will last for from ten to twenty days, and will ultimately become absorbed, so that it does not furnish any possibility of becoming the nucleus of new-formed gall stones, as may be the case when silk is used. If the operator is now quite satisfied with the accuracy and adequacy of his suture, he may drop the gall bladder back into the abdomen and close the abdominal wound without drainage, thus completing what is known as the "ideal operation." If he feels any doubt, there is no question of the advisability of placing a drain of gauze surrounding a rubber tube down to the seat of operation before closing the abdominal wound. This is a precaution that no ambition to achieve the "ideal operation" must be allowed to interfere with. If the suturing should prove to be effective, no leakage will occur, and the abdominal drain may be safely removed within five or six days. This will permit the track of drainage to fall together and heal by tertiary intention, so that the total length of time occupied in healing will not be increased by the fact of drainage having been employed.

THE INTEGRATIVE ACTION OF THE NERVOUS SYSTEM.

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During past years the study of the nervous system has, in the main, proceeded along two lines: on the one hand, there has been the investigation of the structure of the nerve cell; on the other, there has been the study of connecting tracts and of the localisation of function. This work, which may be termed a geography of the nervous system, was needed as a foundation for precise neurological knowledge, and it has attained a high degree of development. The complementary work of examining the processes in this system, whose complexity has been unravelled, of determining its precise functions, has shown less rapid progress, owing largely to the difficulty of experimentally investigating the functions of the central nervous system. But the advance has in reality been great; its extent can perhaps best be gauged by comparing the presentation given in a recent volume of lectures[1] by Professor Sherrington, with what is to be found in text-books of a time not long past. A statement of the main lines of treatment and conclusions in this volume will indicate in the best way the mode in which the problems of experimental neurology are now being regarded.

In the introductory chapter we have first the statement of what nervous integration signifies, as compared with the integration secured by mechanical or chemical agencies. The unit mechanism in integration is the reflex arc; the unit integrative act is the reflex. In accordance with this statement, the work of developing the theme consists in determining first the functions of the simple reflex, and subsequently those of a complex reflex system. Beginning with this abstract but useful conception of a simple reflex, the author deals with the characteristics which are given to it first by the receptor, and next by the conductor. The modification attributable to the receptor is briefly dealt with; it consists in selective excitability, the threshold being lowered to special stimuli. We have then a prolonged examination of the functions of the conductor, extending from the first to the third lecture; each feature in the reflex being compared with a similar feature in the nerve trunk. It is pointed out, to begin with, that part of the reflex arc lies in grey matter, and it is urged that the only feature of the grey matter which seems to be adequate for explanation of the differences between conduction in nerve trunk and in reflex, is the presence of a surface of separation between the nerve cells in the synapse. In regard to reflex latency, it is concluded that the most significant fact is not the absolute lessening of speed in the reflex as compared with the nerve trunk, but the relatively great lessening in the reflex under the operation of weaker stimuli. The fact that an "incremental" reflex superposed on an "initial" reflex has, on the whole, the same latency as the "initial" reflex, shows that the latency cannot be due to a "setting of points": the view that conductive communication is conditioned by movement of cell protoplasm seems thereby negatived. The after discharge—another special feature of the reflex—is shown to be heightened by prolongation as well as by intensification of stimulus. Irreversibility of direction in the reflex arc, the difference between the rhythm of excitation and response, and the refractory phase in the reflex arc, are all attributed to the synaptic junction as the fundamental condition. It is found, in opposition to other views, that the intensity of reflex action is actually graded in some degree with relation to the grading of the stimulus. This increase of end effect with intensification of stimulus is mainly due, not, as Gotch suggests, to increase in the number of motor neurones affected, but to graded activity of a unified centre; at the same time, such an alteration in the extensity of the central excitation is, no doubt, to be found.

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[1] "The Integrative Action of the Nervous System," by Charles S. Sherrington, M.D., F.R.S. London, 1906.

Inhibition is treated on the principle that it is not an independent phenomenon, but an essential feature of the process of excitation. When an animal can act in many different directions, harmonious action is possible only if one definite type of action holds the field and the opposing reflexes are suppressed; it is in this fact that we have the meaning of reciprocal innervation, in which the inhibition and relaxation are "co-ordinate reciprocal factors in one united response." As regards the site of inhibition, the fact that a group of neurones, inhibited so far as entering into one particular reflex is concerned, is open to the operation of another reflex, shows that it is not the motor neurone, but some internuncial mechanism, that is affected by the inhibitory process. Certain facts seem to suggest the existence of specifically excitor and inhibitory terminal branches of the afferent nerve fibres. But it is to be noted that change of internal condition may convert a connection that is primarily inhibitory into one that is excitatory. One of these agents is strychnine; its action, as precise experiment has shown, is not so much to set open all channels, as rather to change inhibition of the affected process into excitation. The same phenomenon is found, with some minor differences, in the action of tetanus toxin.

In dealing with the compounding and interaction of reflexes, the dominating principle is that of the common path. The afferent neurone is a private path; on the other hand, we have an internuncial common path and an efferent final common path. From the existence of such common paths, it follows that there can be no ultimate qualitative differences in nervous impulses, and again, that where the effector is to be used in different ways, this is possible only through successive use. Where reflexes are harmonious and mutually reinforce each other, we have allied reflexes; where, on the other hand, there is inhibition or opposition, there we have antagonistic reflexes. Wherever it is found, the common path is a mechanism for co-ordination; by its means there is put at the disposal of each receptor an extensive system of effectors, while, on the other hand, one effector may be employed by many receptors.

The first point to be noted regarding simultaneous combinations of reflexes is the fact of irradiation; with increase of intensity of the stimulus there may be a far-reaching spread of reflexes. The character of the spread seems to be understood best by referring to the nature of the synapse. Rules for the irradiation are given, and then Pflüger's laws relating to the same facts are subjected to a detailed examination which leaves little of these laws standing. Attention is drawn to the bearing of the collection of fibres in afferent and efferent roots on co-ordinate movement, and it is pointed out that in neither case have the particular roots, as such, definite functional significance. The general effect of overflow of reflex action is that allied reflexes are excited to combined action; we thus have reinforcement or *Bahnung*, which leads to unified, harmonious individual action.

In dealing with successive combinations, it is pointed out that through the operation of spread or immediate induction each reflex favours the appearance of the next allied reflex. Thus the maintenance of a series of harmonious reflexes is assured when the stimuli are approximately similar. When, on the other hand, the difference of stimuli passes a certain limit, there is interference between the first reflex and that which is called forth by the second stimulus. Such interference is specially marked in alternating and compensatory reflexes: in the former we have a sequence of antagonistic reflexes possessing the final common path in turn, while in the latter we have the return to a state of equilibrium, such as posture, which has been disturbed by an intercurrent reflex. In connection with these facts there is given a discussion regarding the fundamental nature of inhibition, in which the most significant points of each theory are emphasised. Of the factors contributing to determine which one of competing reflexes will prevail, the most potent is intensity, but there are to be noted also the immediate induction above referred to, successive induction, fatigue, and the specific character of the stimulus. Successive induction is in many ways the reverse of the other form; it prepares the way, and reinforces not an allied but an antagonistic reflex. It is exemplified in the fact that if a reflex, such as crossed extension, is interrupted by flexion, there is a rebound effect when the flexion terminates, which goes beyond the previous extension, and which is proved not to be due to mere rest. By the action of this factor, alternating reflexes tend to be maintained even apart from definite stimulation. Several important facts are pointed out in regard to fatigue, which indicate that what is termed fatigue is in many respects functional in nature, a process which is adapted to prevent a particular line of activity, a particular effector, from being continuously and exclusively occupied by any one receptor, and which thus secures serial variety of reaction. Finally, it is important to note the quite distinctive place occupied by reflexes connected with receptors which are stimulated by agencies threatening damage—the noci-ceptive receptors; their hold on animal activity is prepotent and imperative, and is only approached by one other reflex, which again is affectively toned, the sexual reflex.

We are led next to consider reflexes as adapted reactions. The conception of purpose is useless for physiology so long as it is external; it becomes fundamentally important when it refers to the value of a reflex, or other organic adjustment, in enabling the animal to dominate its environment. The bearing of shock on the examination of reflexes is discussed, and it is pointed out that the muscular tissue which survives is not directly connected with the synaptic nervous system, and that the reflexes which survive best are the noci-ceptive. There is given also an account of pseud-affective reflexes, in which purpose seems indicated with special clearness, together with a determination of the path of pain impulses, and also an account of experimental work by which it is rendered highly probable that visceral and motor sensations are not the primary factor, but are rather a secondary and reinforcing factor in the development of emotion.

After a reference to the demonstration that in the anthropoid apes the motor area of the cortex is entirely precentral, it is pointed out that the reactions initiated in this portion of the cortex are in many respects similar to those found in the spinal cord; inhibition is demonstrable as a result of its excitation, and the reversal of inhibition by strychnine (probably in the spinal cord) is seen also on cortical excitation; reactions absent in the cord are not represented in the cortex, and so forth. Strikingly contrasted with all such spinal and cortical reactions is the muscular activity evident in the persistent decerebrate rigidity which ensues, for example, on section across the mesencephalon. The result of an examination of this condition is to show that there is actuated by a cranial mechanism, situated between cerebrum and bulb, a musculature which cortical excitation and the local reflexes do not widely and effectively touch. This musculature is the system which antagonises gravity; to resist this constant force there is the persistent tonus, which we see exaggerated in decerebrate rigidity. Thus there seem to be two systems of motor innervation actuating two muscular systems: the one gives steady tonic attitude or posture, the other gives transient phasic movements, which whenever they appear must inhibit this tonic contraction. It is pointed out that this distinction was recognised by Hughlings Jackson many years ago; the cerebellar origin of tonic contraction which he upheld is now replaced by reflexes initiated through afferent nerves of muscles and the otic labyrinth — the proprio-ceptive system. The real difference between cortical and spinal reactions appears to lie in the character of the receptors with which they deal. The cerebrum is intimately and exclusively related to the receptors which mediate reaction to distant objects—distance receptors. It is these receptors and the actions initiated by them which have to do with the behaviour of the animal as a whole; it is through them that the cerebrum has attained to control not merely of the leading segments, but of the whole organism.

Following on this analysis, a statement is given of the physiological position and dominance of the brain. The introduction to the discussion consists of a rapid review of the reactions of the unicellular organism, the multicellular organism with diffuse nerve net, and the organism controlled by the synaptic system. By the synaptic system and the common paths which it provides, there is secured the unification of the segmental series and the co-ordination of action. It is plain that the receptors in the leading segments will tend to develop, for their elaboration will be of pre-eminent advantage to the organism; in giving the animal indications regarding objects at a distance, they acquire the psychical character of projicience. While the other receptors on the whole are related to action of part of the segmental series, these distance receptors relate the whole segmental system, the whole individual, to the environment, advantageous or dangerous. They give rise to precurrent reactions, while the former initiate consummatory reactions. By means of the projicient receptors the range of experience is immensely increased for the head segments; the same pre-eminence is found to be attached to the otic labyrinth as head receptor of the proprio-ceptive system. And just as the cerebrum is the head ganglion for the system of extero-ceptive receptors and neurones, so the cerebellum is the head ganglion for the proprio-ceptive system, as being built over the otic labyrinth, the most important member in that system. It is through the enormous increase in the neural connections which are built upon the distance receptors that the development of the higher animals is made possible; their domination over the environment is secured not by increasing refinement of receptors, but by the elaboration of inner cerebral adjustments.

The final lecture deals with the question whether the process of sensory co-ordination and fusion is to be interpreted according to the rules which hold for co-ordination in a motor reflex. The problem is studied by arranging an apparatus through which the two retinæ shall be capable of being stimulated on corresponding areas by various synchronous or alternate images. It is found that the difference between synchronous and alternating stimulation of corresponding points by precisely similar patches of light is so slight as to be negligible. Were the two retinæ united so as to function as one receptive surface, then Talbot's law should hold: these experiments show that it does not hold, and consequently the retinæ must be held to retain independent function. Other experiments with asymmetrical flicker, *i.e.* with the images of the two eyes presented with unequal intermission and unequal brightness, show that the rate of flicker of the right set of images affects that of the left, and so on; in other words, the two retinæ do seem to exhibit mutual interference. But, in fact, the results can equally well be expressed by another rule abundantly verified, that when patches of unequal brightness are presented to the two retinæ, the resulting brightness appears to be near the arithmetic mean of the contributing images; here and elsewhere there is no trace of summation.

It is contended that were the processes from right and left retinæ unified early in the retino-cerebral path, there would necessarily result interference and summation of the visual impulses. But the observations indicate that such processes do not take place. The fusion of binocular images appears to be a fusion of already elaborated perceptual products. It is urged that these observations indicate separateness of the cortical seats of the images from the two retinæ, and that the conductive connecting paths which no doubt exist are not needed for the unification of the images. And the convergence of paths from corresponding retinal points to the same cortical area is regarded, not as affording a basis for sensory fusion, but rather as serving for the unified efferent discharge by which the contraction of the eye muscles is regulated. It is suggested, further, that "pure conjunction in time, without necessarily cerebral conjunction in space, lies at the root of the solution of the problem of mind." In the final sections, some of the relations between psychology and physiology are indicated, and emphasis is laid on the pressing nature of the problems regarding the physiological processes underlying voluntary control, and regarding the relations between it and reflex and habit. The line of reflection suggested regarding these topics is that which looks on consciousness and volition as essentially signifying control, and regards the brain as having fundamentally the same function of organisation and control.

Such a brief sketch can only give a very imperfect idea of the richness in fact and outlook of this volume of lectures, but enough has been said to give some conception of the scope and aim of the treatment. It is of the greatest value not merely as a comprehensive reasoned statement of the author's own investigations and those of other workers, but as emphasising aspects of the nervous system which have not hitherto received adequate attention. It will be observed that throughout the volume structural detail is subservient to the study of the actual processes, of the complex shifting play of excitation and inhibition in the life of the central nervous system, and that the various component processes are presented as features of the adaptation and integration through which the life of the organism is maintained and its domination of the environment secured. It may be regarded as merely another aspect of the treatment, that the author should find it profitable to utilise the conception of purpose scientifically interpreted, and should insist on regarding the superficially disconnected or opposed reactions of the nervous system as varying subordinate processes in the co-ordinated unified organic life. And it is significant that in the study of various points, physiological and pathological data are found to supplement each other in giving an account of function.

The point which will perhaps arouse most discussion is the conclusion in the last lecture, that a physiological basis for psychical fusion and the unity of mind is not present, and indeed is not required. The facts are unquestioned: it is the interpretation which may occasion difficulty. The question, it would seem, which has to be answered, is whether it is possible to conceive of an adjustment of cerebral processes which would admit of their qualitative union without summation or interference, and would thus afford a physical basis for the process of psychical fusion. It is not possible here to do more than refer to the problem; it is, however, clear that it is of fundamental importance both for the physiologist and the psychologist. To the student of medicine, the most immediately interesting sections will probably be those in which the investigations are summed up by which at last the actual changes in physiological process which are initiated by strychnine and by tetanus toxin are brought to light. The hope seems justified that the further development of such modes of treatment as are here presented holds much in store for the more intimate analysis of the cortical reactions, and for the ultimate control of their pathological modifications.

ON THE USE OF THE OPSONIC INDEX IN THE DIAGNOSIS OF TUBERCULOSIS.[1]

By IAN STRUTHERS STEWART, M.D., and L. C. PEEL RITCHIE, Ch.M., F.R.C.S.Ed., *Research Students, University of Edinburgh.*

From the Surgical Laboratory, University of Edinburgh.

IN all forms of tuberculosis early diagnosis is essential to successful treatment, but frequently the diagnosis is uncertain on account of the indefiniteness of the physical signs in the earliest stages. The result of this is that valuable time is lost, as it is not always politic to treat a case as one of tuberculosis unless the diagnosis is certain.

Hitherto, apart from clinical or direct pathological evidence of the existence of tubercle, the only method which might be considered reliable is the observation of temperature changes resulting from the inoculation of Koch's old tuberculin. Considerable difference of opinion exists as to the reliability of the results so obtained. At the best the method is cumbersome, necessitates the patient being confined to bed under careful observation for several days, and may require to be repeated more than once before a conclusion is arrived at. Add to this the possible discomfort and risk—though this is denied—to which the patient is subjected as a result of the large doses employed. While Koch, on the one hand, claims 99 per cent. of success, the error is generally estimated at about 10 per cent. Its employment is also limited by the fact that it cannot be adopted when the patient is already exhibiting a temperature rising over 100° F.

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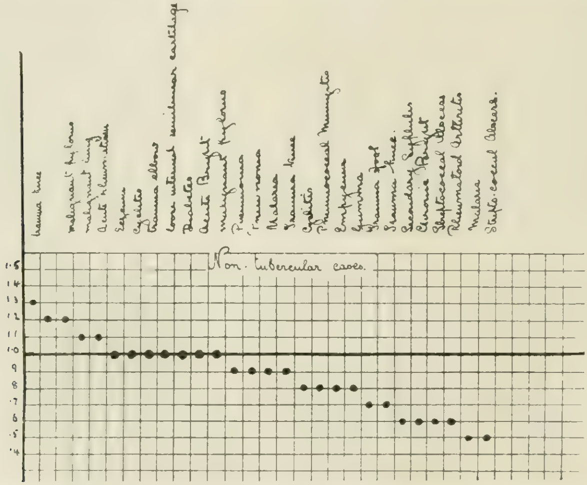
[1] A paper read before the Edinburgh Medico-Chirurgical Society, March 6, 1907.

The morphological examination of the blood and the presence of the diazo-reaction in the urine are too uncertain, especially in the early stages, to obtain an assured position among the means of diagnosis.

We propose to bring before you to-night a method at which we have been working for some time, and by which we think it possible to diagnose tubercle even when the symptoms and signs are not conclusive. The method consists in the injection of a minute dose of tuberculin R., in conjunction with the observation of the tuberculo-opsonic index of the blood before and after inoculation. Our conclusions are based on observations made on 122 consecutive cases, which include the more common forms of medical and surgical tuberculosis.



The first point we propose to take up is the question whether one estimation of the tuberculo-opsonic index gives sufficient grounds for the formation of a diagnosis of tubercle, as has been put forward by several observers.

We have divided our cases into the following groups:—

1. Cases in which there is every reasonable ground for coming to the diagnosis of tuberculosis. In a large proportion this conclusion is based upon pathological proof from the examination of discharges, sputum, urine, etc., or by operation, and in the

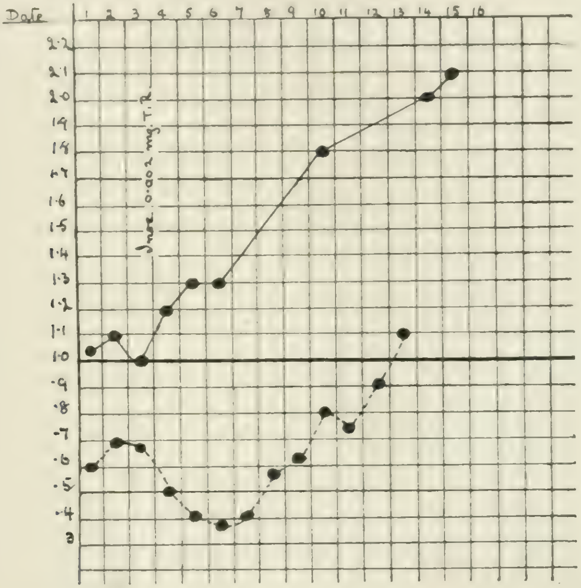
remainder upon the continued observation of the clinical course of each case.

2. Cases either normal or suffering from diseases other than tuberculosis.

A few cases in which, on the grounds just mentioned, we have not felt justified in coming to any definite conclusion, have been left out of consideration.

Several observers have shown that the tuberculo-opsonic index may vary slightly in health. The normal limits of variation are from 0·8 to 1·2.

The first group, *i.e.* the tuberculous, comprises a total of eighty-two cases. Of these, forty-one have their tuberculo-opsonic index within the normal limits, and forty-one outside. This group comprises cases of pulmonary tubercle, gland tuberculosis, tuberculosis of bones and joints, and a small group of tuberculosis in various other parts. The cases of pulmonary tubercle in an acute stage all showed the tuberculo-opsonic index above normal: in chronic cases the index was found to be either normal or subnormal. In the cases of gland tuberculosis the rule was to find a subnormal index, but in a small proportion of cases the index was found to be up to the highest normal limit. In tuberculosis of the bones and joints by far the larger number of the cases had their tuberculo-opsonic index within the limits of health, the rest being subnormal, with the exception of three in which the index was high. In the non-tuberculous cases the



majority were, as one would expect, within normal limits; and of those outside, with one exception, the index was subnormal. The cases showing the subnormal index were, with one exception, suffering from some infective disease.

In the second group we have a total of forty non-tuberculous cases; and of these, twenty-nine are within the normal limits and eleven outside.

A diagnosis based on one examination of the tuberculo-opsonic index would thus have resulted, in the tuberculous cases, in an error of diagnosis of 50 per cent. On the other hand, among the non-tuberculous cases, which includes many normals, 27·5 per cent. are outside the normal limits, and the relying on such a test would lead to an error of that extent. These non-tuberculous cases outside the normal were, with one exception, subnormal.

In acute tuberculous cases, if the opsonic index be noted daily for several days in succession, it will be seen that instead of remaining more or less stationary, as in health, it varies considerably, being one day low and another day high. As might easily happen, one examination of the opsonic index might be made for diagnosis and fall at a period between the two extremes of variation, when the index was within normal limits, and so lead to error in diagnosis.

In the paper by one of us, in conjunction with Dr. Lawson of Banchory, read before the Society, it was shown that if a small quantity of tuberculin R. were injected into a patient suffering from tuberculosis, there was a diminution in the opsonic index, but that in a healthy person the reverse was shown to be the case. Following out this line of inquiry, we have inoculated and examined the blood of seventy-five cases. Before giving the results, it is proposed to describe the methods carried out in all these cases.

On the first day the patient's blood is taken and the opsonic index to tubercle estimated. An inoculation of tuberculin R. is given. The tuberculo-opsonic index is further estimated on the two following days.

For the purposes of control, the blood of both observers were taken and examined separately, and the average found. The figures so obtained were used as representing the normal opsonic index of 1 for that series of preparations. The sera of the two controls were not mixed, as the method of separate controls makes it easier to exclude technical errors. It was customary to count the number of bacilli ingested by at least 120 polymorpho-nuclear leucocytes, as in the opinion of the writers thirty cells are not sufficient.

The dose of tuberculin R. found most suitable in the case of adults was $\frac{1}{500}$ mgrm., and in children under 12, $\frac{1}{1000}$ mgrm.

The term "negative phase" is used to indicate the diminution of the tuberculo-opsonic index which follows the inoculation of an infected person with tuberculin. The depth of the negative phase, as a rule, is less where the primary index is low than where it is high. The usual fall in a tuberculous patient was 0·2.

The tuberculous cases which were inoculated number sixty-two, and include all the more common forms of medical and surgical tuberculosis. In fifty-six of these cases we have obtained a negative phase. This represents a proportion of 90·3 per cent. In thirteen cases, either normal or suffering from diseases other than tuberculosis, in no instance did we obtain a negative phase after inoculation with similar doses.

Our conclusions are as follows:—

1. A single estimation of the opsonic index is an unsatisfactory method of diagnosis, as both tuberculous and non-tuberculous cases fall within and without normal limits.

2. If a negative phase appears after inoculation, the presence of tuberculosis may be diagnosed.

3. The absence of a negative phase indicates the absence of a tuberculous infection.

The method which we advocate, as may be seen, compares favourably with all that has been claimed for the reliability of the old tuberculin test. It has, however, the distinctive advantages of being applicable to any and every case, of interfering in no way with the patient's ordinary avocation. The tuberculin employed is a bacillary product, and is free from such toxins as the old tuberculin contained. The dose given is a small one, being within the therapeutic limits. We have given this quantity now in scores of cases, and have never met with any instance of harmful effects or discomfort attributable to it. If treatment with tuberculin R. be instituted, the diagnostic inoculation forms the first of the series of therapeutic injections. In a few cases, Koch's latest preparation, tuberculin B.E. (Bazillen-Emulsion), which is of a similar nature to T.R., has been employed for diagnosis, and has been found to give equally good reactions. It should further be noted that we find that the reaction is a specific one; that is to say, that the ingestion of tuberculin affects only the tuberculo-opsonic index, and not the index for other organisms, such as, for instance, staphylococci.

Of perhaps equal importance to the diagnosis of tubercle in its early stage is the determination of complete recovery from a tuberculous infection. From our observations on this point we have reason to believe that the method described is equally applicable. The absence of a negative phase corresponds to recovery from tuberculosis. It should be noted, however, that if the patient has been undergoing treatment by means of T.R., the reactions obtained are unreliable unless a sufficient time is allowed to elapse after the last inoculation to permit of the blood resuming its normal condition. This implies a period of probably at least two months.

While the observations in this paper have been confined to tuberculous infections, it may be surmised that this diagnostic blood reaction to an injection of a dead bacillary suspension might be adopted with corresponding success in other infections; and such, in fact, has been our experience. We leave this point to be dealt with on another occasion.

The opsonic estimations were carried out in the University Surgical Laboratory, and we gladly take this opportunity of thanking Professor Chiene for every facility granted to us there.

The patients were for the most part attending the Surgical Out-Patient Department of the Infirmary. To the surgeons in charge of that department, and to other members of the staff, we gratefully acknowledge the material placed at our disposal.

PHAGOCYTOSIS OF ERYTHROCYTES, AND THE QUESTION OF OPSONIN IN PAROXYSMAL HÆMOGLOBINURIA.

By J. Eason, M.D., F.R.C.P.Ed., *Assistant Physician, Leith Hospital.*

At the present time a controversy of considerable interest is proceeding, the point at issue being to determine the identity of the substance in the blood which exercises the opsonic function. More precisely, the point to be determined is whether the so-called opsonin of Wright and Douglas possesses characters which prove it to be a substance which differs from the amboceptor or immune body; that is to say, does it lose its power of opsonising on being heated for thirty minutes at 55° C., and also on being kept *in vitro* for some days; or does it, like the amboceptor, retain its power after such treatment?

Dean's paper in the *Proceedings of the Royal Society of London* goes far to prove that the term "opsonin" applies to the substance which is already known by many names, among which may be mentioned *amboceptor, fixateur, immune body, intermediary body, substance sensibilisatrice*, etc.

At the same meeting of the Royal Society, Wakelin Barratt described a series of experiments which led him to conclude that the substance which causes phagocytosis of *erythrocytes* in a hæmolytic serum is thermo-labile. Consequently he thought the substance "is a special constituent, which is a member of the group of opsonins first described by Wright and Douglas in respect of bacteria." To this substance Barratt applies the name *hæmopsonin.*

Now there is, of course, nothing new in the idea that an immune bacteriolytic or hæmolytic serum induces increased phagocytosis of the cell or micro-organism to which immunity exists.

Such phagocytosis is the basis of the Metchnikovian theory of immunity. Moreover, the extraordinary eagerness of the phagocytic action towards bacteria and erythrocytes in the presence of an immune serum has been demonstrated by such investigators as Savtchenko, Ruziczka, Levaditi, and Gruber, by experimental work on animals.

In a former paper I have already quoted the works of these authors, and Savtchenko's work occupies an important place in the recent literature of immunity. The above-mentioned investigators satisfied themselves, by careful and ingenious work, that the substance inducing the phagocytosis was the immune body. This work antedated that of Wright and Douglas, by whom the technique has been adapted for clinical purposes.

The only disease occurring in the human subject on which Wakelin Barratt's views on hæmopsonins appear to have any practical bearing at present, is paroxysmal hæmoglobinuria. In this disease it has been shown by Donath and Landsteiner, and myself independently, that the hæmolysis depends on the activity of an intermediary body or amboceptor, whose activity is in abeyance if the blood is maintained (*in vitro*) at the normal temperature. Under such circumstances no hæmolysis occurs. But if a tubeful of blood is allowed to cool in ice water after being mixed with 0·25 per cent. pot. oxalate in 0·85 per cent. saline solution to prevent coagulation, and is thereafter placed in an incubator at 37° C. for a short time (three hours), hæmolysis occurs, while control tubes of normal blood, under similar conditions of temperature, show no hæmolysis.

If microscopic preparations be made from the tube containing the pathological blood after it has been thirty minutes in ice water, and a similar period in the incubator at 37° C., it will be found that a very active solution of the erythrocytes by the phagocytes is proceeding.

It was this observation, which I have frequently made since 1903, that first enabled me to conclude that we had to do with the presence of a hæmolytic amboceptor in the blood of paroxysmal hæmoglobinuria. Such a conclusion appeared justifiable in view of the evidence which I have above quoted from the investigations of Savtchenko, Gruber, Ruziczka, and others, that such phagocytosis in experiments on animals was the result of the union of amboceptor and erythrocyte.

I have previously described the nature of this phagocytic process which is, at least, *as greatly participated in by the polymorpho-nuclears as by the mono-nuclears.* By reference to my previous paper in this Journal, and to the investigations of Gruber and Ruziczka, it will be seen that this process is a phagocytic one, but that the erythrocyte is dissolved at its point of contact with the phagocyte, and it is therefore partly an extra-cellular process, although the hæmoglobin becomes absorbed. Large vacuoles about the size of a red corpuscle may be seen sometimes in the polymorphs. These may be blood corpuscle shadows, but of that I am not yet convinced. Phagolysis sometimes appears to be proceeding as rapidly as hæmolysis, and the erythrocytes appear to undergo very rapid solution in the medium (complement?) thus set free from the leucocytes. This process may also be observed if the inactivated serum of a case of paroxysmal hæmoglobinuria is mixed with washed corpuscles and leucocytes from a normal individual, and is submitted to the condition of temperature already described. This form of phagocytosis would therefore not appear to be dependent on the action of a thermo-labile substance or normal opsonin, but of a thermo-stable substance which may be either the hæmolytic amboceptor or a body corresponding to the thermo-stable opsonising substance which, according to Muir and Martin, is artificially produced by immunising an animal.

These results are therefore not in agreement with the observations of Wakelin Barratt, but with those of Dean on the phagocytosis of bacteria. Again, my own observations in paroxysmal hæmoglobinuria, and those of Gruber and the recent work of Keith, agree in finding the polymorphs as very active phagocytes for the erythrocytes. Barratt maintains the older view, that the mono-nuclears are chiefly concerned in this process.

The observations which I have above described may be made clinically by employing the method originally used by Ehrlich to simulate the conditions of a paroxysm. An elastic ligature is put round a finger of the patient. The finger is then put in ice water for a short time (five to ten minutes), and is then put in warm water for a similar period of time. Blood is then obtained in the usual way for film-making, and stained.

Thus it appears that the phagocytosis is as much dependent on the previous chilling of the blood as is the extra-cellular lysis, another indication that the amboceptor is the cause of both processes.

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TWO CASES OF PERIODIC FEVER, RESULTING FROM ANIMAL BITES.

By ALFRED H. CARTER, M.D., F.R.C.P., *Professor of Medicine, University of Birmingham.*

THE following cases are worthy of record, as they show a special type of fever following the bites of animals, which, so far as I am aware, has not hitherto received attention.

CASE 1.—A. A., male, æt. 40, was admitted into the Queen's Hospital under the care of Mr. Bennett May, on 9th October 1901, with the following history:—He had been bitten by a rat nineteen days previously, on the second finger of the left hand. The wound was slight, and quickly healed, without suppuration. Two days later, a point of redness appeared near the scar, gradually extending up the arm, which became painful, tender, and swollen, with some enlargement of the glands in the axilla of the same side. The lymphangitis soon subsided after his admission, but it was followed by a protracted series of febrile attacks, for which he was transferred to my care on 11th December. From the time of his admission to that of his discharge, comprising a period of 155 days, he had twenty-six febrile paroxysms, separated by intervals of apyrexia, generally lasting two days, until towards the end of his illness, when they became longer. The average duration of the attacks for the first three months was about three days. Afterwards they became shorter, and, towards the end, were usually completed within twenty-four hours. The highest temperature reached in any single attack was 104°·2, on 26th November.

The attacks were ushered in with a feeling of languor, weakness, and nausea, without actual vomiting, and without rigor. Aching pains were then complained of all over the body, and the patient became very hot and thirsty, with a dry skin, until the temperature reached its height. At this point the skin became moist, merging into a profuse perspiration, generally followed by sleep, from which he awoke much relieved, but exhausted. The earlier attacks were accompanied with considerable stiffness of the arms, neck, and masseters; so much so, that at times the mouth could only be opened with pain and difficulty. A patchy erythematous eruption commonly appeared about the shoulders and upper part of the chest during the attacks, accompanied with slight itching. The rash slowly passed away as the attack subsided. He also, during the attack, very generally complained of spasm in his throat, with difficulty in swallowing, and very free mucous secretion, which appeared to come from the throat and nasal passages.

Painful and tender enlargements of cervical glands were noted in some of the attacks. On that of 1st January a small tender subcutaneous lump was observed on the upper and inner side of the left forearm. A similar lump was noted under the skin of the left calf during the attack of 11th January. In the attacks immediately following these dates, slight tenderness and swelling returned at the same spots. In each instance the swelling subsided during the intervals. During the earlier attacks the spleen was enlarged and easily palpable. Each attack was attended with considerable leucocytosis (16,000–22,000 per c.mm.), rising and falling with the temperature, and mainly consisting of an increase in the polymorpho-nuclear cells. Bacteriological examination of the blood yielded only negative results.

Towards the close of the illness the attacks became shorter and milder, the apyretic intervals longer, and he was discharged on 13th March 1902, quite well, and he has remained well ever since.

Case 2.—On 19th August 1904, I was called to see a gentleman, æt. 19, in consultation with Drs. Gostling and Greensill, with the following history:—He had been bitten by a cat nine weeks previously, at the root of the index finger of the left hand. The wound was slight, and quickly healed, and he thought no more of it until five weeks later, when a blush appeared near the seat of the original wound, with local pain and tenderness. This was followed by well-marked lymphangitis of the left arm, and swelling of the glands in the left axilla. It gradually subsided without suppuration, but shortly afterwards the temperature again rose, and was accompanied with some enlargement of the glands in the right axilla, restlessness, headache, insomnia, nausea, and loss of appetite. Reddish spots and patches also appeared on the body and limbs. The attack gradually passed off with sweating; but in the course of a few days the fever returned with exactly the same signs and symptoms as before. This in turn subsided, only to be followed by another, in the course of which the left epididymis became swollen and tender. It was at the close of this attack that I first saw him. Since that time, up to the close of the year, he had sixteen further attacks. The regularity of recurrence was even better shown than in the previous case. On the average, he had one attack each week. The earlier attacks were protracted, and the intervals between them were only marked by remission of the temperature. But after 15th September the attacks became shorter, usually lasting about three days, and separated by intervals of complete apyrexia. The illness continued for five months, after which his recovery was complete.

The attacks were ushered in by chilliness (and sometimes by a distinct rigor), accompanied with muscular pains and stiffness all over the body, but especially about the neck and shoulders, which rendered all movement difficult and painful. The stage then set in characterised by increasing fever, extreme flatulence, often leading to vomiting, with muscular stiffness and twitching. After the first few attacks the stiffness ceased, but the twitching continued to recur for some time longer. The same patchy efflorescence as in the previous case was observed in many of the attacks (though not in all) about the chest, back, face, and limbs. The rash had a dusky red tinge, and left a brownish stain behind, which lasted several days The same trouble also occurred from accumulation of mucous secretion about the nose and throat, though it was absent in the earlier attacks. These symptoms continued with more or less severity until the temperature reached its maximum, when they gradually passed off as the temperature fell. The skin became moister, till perspiration was profuse, and the attack often ended in a critical sleep, from which the patient awoke well.

Dr. Miller, Lecturer on Pathology at the University of Birmingham, very kindly visited the case on 16th November, just as an attack was maturing, and gave me the advantage of his large experience, by a careful examination of the blood. He found, on an average of two counts, 15,100 white cells, yielding, on a differential count after staining—Polymorpho-nuclears 88·2 per cent., lymphocytes 9·7 per cent., large mono-nuclears 5 per cent., transitional forms 6 per cent. The red cells showed slight irregularity in size. Many of them showed small basophilic spots in their substance—a condition known as granular degeneration or punctate basophilia. No nucleated forms were found. Blood plates were in considerable excess.

Bacteriological examination.—Two c.c. of patient's blood were drawn from a superficial vein in the forearm, with antiseptic precautions. One c.c. was introduced into an Erlenmayer flask containing 50 c.c. of broth, and the other was mixed with 40 c.c. normal saline solution. The broth flask was incubated at 37° C. After sixteen hours there was no growth. After thirty-eight hours a coccus was found, which on further examination proved to be the *Staphylococcus pyogenes albus*. Ten c.c. of this broth culture were injected into the peritoneal cavity of a rabbit. The temperature of the animal remained normal, and showed no sign of infection eleven days after inoculation.

The mixture of blood and saline solution was also placed in the incubator at 37° C. for sixteen hours. Ten c.c. of the mixture were then injected into the general circulation of a rabbit by way of the ear-vein. On two occasions blood was removed from the ear and examined both microscopically and bacteriologically, with cultures in various media, but with negative results. A second rabbit was inoculated with 10 c.c. of the saline blood mixture, the injection being made into the peritoneal cavity. Both rabbits lost weight, and the temperature of the former was slightly raised, but otherwise the animal remained unaffected.

Dr. Miller's conclusions.—Undoubted polymorpho-nuclear leucocytosis. Red cells irregular in size. The punctate basophilia is a condition which occurs in severe anæmia, and in cachectic states accompanying septic poisoning. The absence of nucleated red cells is a point worth noting. The increase in blood plates is also often associated with anæmia. No other evidence of anæmia, the cells being well formed and uniformly pigmented. The bacteriological evidence, so far as it goes, points to the disease being caused by some poison in the blood, which might or might not be due to the presence of a localised focus of bacterial activity.

The close similarity of the phenomena observed in these two cases, taken together with the very similar circumstances under which they occurred, strongly suggests that their pathogeny is essentially the same. There seems also to be very little doubt that we have to do with a toxæmic state, which, from the periodical behaviour of its manifestations, is difficult to attribute otherwise than to bacterial origin. On the other hand, a very careful bacteriological examination of the blood having been made with negative results, it is difficult to believe that organisms of any kind were actually circulating in the blood. On the whole, therefore, Dr. Miller's suggestion of a focus of bacterial activity localised in the original seat of injury, such, for instance, as occurs in tetanus, is a very plausible one. Moreover, the prominence of muscular pains coupled with marked stiffness, which, in each case, were best marked in the muscles of the neck, tempt one to suspect some kind of qualitative relationship between the toxins of these cases and that of tetanus—a suspicion which is still further strengthened by the muscular twitching in one case and the muscular spasm in the other. We must not be too strongly influenced by these speculations, and at present I content myself with bringing the cases forward as items of striking clinical interest.

REVIEWS OF BRITISH AND FOREIGN LITERATURE.

Collected Papers on Circulation and Respiration. First Series. By Sir Lauder Brunton, F.R.S., etc. London: Macmillan & Co. Ltd.

In his preface, Sir Lauder Brunton tells us that this volume is to be followed by a second series of collected papers on clinical subjects. Here is only an account of his laboratory researches. As one glances through the titles of the papers, the first thought is, how much modern medicine owes to the author; the second, what an output of work from one man. Sir Lauder Brunton apologises for a preface too long and too personal for the majority of readers; we beg leave to differ from him as to this, for his introductory pages are by no means the least fascinating in the volume. He tells how his first laboratory was a room measuring 6 feet by 10, and how, by the time it was replaced by a more commodious one, the claims of practice having begun to interfere with research, he deliberately adopted the plan of working at his profession so as to make money enough to pay the salary of a younger man to devote his whole time to research. Thus we owe a twofold debt to Brunton: for the head which could organise attacks on pharmacological problems, and for the scheme which trained experimenters such as Cash, Weymouth Reid, Tunnicliffe, and MacFadyen, to name only some of his assistants.

Many of the papers in the volume have become classics: "On the Use of Amyl-nitrite in Angina" (with which particularly Brunton's name will always be associated, perhaps because, as he says, it may be claimed as the first complete example of rational therapeutics based on experimental and pathological data); a series on "The Action of Digitalis," and the well-known article on the "Experimental Investigation of Action of Medicines," which is in reality a compendious account of experimental physiological methods. The papers, however, are not all pharmacological. There are others on strictly physiological subjects, such as "The Effects of Electricity on the Frog's Heart," and others, again, on the phenomena of disease, such as that on "The Pathology of Exophthalmic Goitre."

Many of the communications own a joint authorship, often, probably, for the reason stated above; in other cases because, as Sir Lauder Brunton simply says, "I like working with those who are interested in the same subjects as myself." Brunton's papers are models of what such writing should be—lucid, detailed, convincing. His desire to verify facts by personal observation is a trait which he shares with all the best class of scientific workers; it is a quality which implies more than lies on the surface, and only a most zealous seeker after truth is willing to expend weeks of work on what, when reduced to print, can be comprised in a nine-word sentence. Yet to be able to say "that pepsin, if absolutely pure, gives no xantho-protein reaction," cost this. We are sure that Sir Lauder Brunton's numerous pupils and many others will welcome this volume of his collected papers, no less than they will look forward to the second series.

The Prophylaxis and Treatment of Internal Diseases. By F. FORCHHEIMER, M.D. London: Sidney Appleton.

THIS book is designed for the use of practitioners and senior students of medicine, a purpose for which it is admirably adapted. The work is essentially orthodox, and the classification of the sections is that common to British schools.

To quote from the Introduction, the treatment of internal diseases is an art, and, like all arts, it is influenced by science; but under all circumstances it is an art practised by one human being upon another. This admitted, it follows that therapy can never become an exact science; for, aside from its being an art, the two human factors, the patient and the physician, will never be reduced to mathematical quantities. The success of treatment depends upon both patient and physician. In treating human beings, we must take into consideration much more than is explained by the present state of medical science; it is not only what drug is given, but frequently how it is given, that produces the desired effect—a fact that cannot be denied.

Throughout the book Dr. Forchheimer pleads for causal treatment, and shows how causal treatment and prophylaxis go hand in hand. At the same time, symptomatic treatment, although not to be put upon the same plane as causal treatment, must not be neglected, and not infrequently the two may be combined. Polypharmacy is to be shunned: the physician should use few drugs, the best of their type, and learn the exact effects—average and individual—to be obtained from them.

In typhoid fever, the diet prescribed is fairly liberal, and the author holds that under no conditions should milk be used exclusively. Brand's treatment, he is convinced, shortens the course of the disease and diminishes the mortality, and statistics to the contrary are due not to faults in the treatment, but to the inventive genius of its modifiers. With other special methods of treatment, as the Schott, Oertel, and Sir William Gowers' method of administering strychnine in progressive muscular atrophy, the same holds good. The technique of vaccinating is described minutely; compulsory vaccination and revaccination are our best means for the prevention of smallpox, but "in English-speaking countries anything that is compulsory immediately meets with opposition." The author has obtained excellent results from quinine and euquinine in whooping-cough, and has found the administration of pepsin before and after salicylate prevent local effects upon the stomach in rheumatic fever. Notwithstanding that "the American spitter can be looked upon as a skilful marksman," the crusade against promiscuous spitting should be carried on with the greatest vigour, not only against tuberculosis, but for the prevention of many other diseases.

In pericarditis the author holds that the use of blisters is a barbarous procedure, and, by his silence, would seem to imply the same in endocarditis. Paracentesis should be resorted to in pericarditis with effusion if there is an *indicatio vitalis*, and "the fluid should also be removed when its presence is sufficient to make the patient an invalid and prevent his following his occupation." This latter statement may be compared with the direction that in severe cases of gastric ulcer "after a nutrient enema the patient should always be kept in bed for at least an hour."

Under myocardial insufficiency a most excellent résumé is given of all the methods of cardiac therapeutics.

On p. 423 the author states that there can be no doubt that many cases of pernicious anæmia are benefited by the proper administration of arsenic, and on the same page he "fully agrees" with Cabot that arsenic has no effect upon the course of that disease.

We cannot endorse the advice to give ergot in cerebral hæmorrhage. In spastic conditions gymnastic exercises are much better performed when the patient is in a warm bath (90° to 95°). The uses, abuses, and limitations of electricity in diseases of the nervous system are very clearly defined.

In the appendix are given tables of the composition of food materials (Atwater), and of liquors containing alcohol; general principles in the treatment of poisonings; a list of the drugs mentioned in the book, with dosage and mode of administration; and, finally, a list of prescriptions.

Mind and Brain. By DR A. BINET. Edited by F. LEGGE. London: Paul, Trench, Trubner, & Co.

ONE of the latest additions to the International Scientific Series is a translation of Binet's "L'Âme et le Corps," under the title, "The Mind and the Brain." The expectations raised by the author's name on account of his previous valuable work in the domain of psychology, both normal and morbid, are quite fully realised in this book. Its subject is one of perennial interest, being, in fact, the central problem of metaphysics. It is handled with a light and deft touch, being clear, concise, and impartial as between the various theories mentioned.

The first two of the three parts into which the book is divided, concerning the definition of matter and the definition of mind, are intended to clear the ground for the last and most important. Regarding matter, his conclusions are that of the external world we only know our own sensations. Objects are to us in reality only aggregates of sensations. Consequently it is impossible for us to form a conception of matter in terms of, say, movement, and to explain by modalities of movement the properties of matter.

In the third part of the book various metaphysical theories as to the union of the soul and the body are discussed, but nearly all are dismissed as inadequate. His own view is contained in the second last chapter. But he is careful to state that it is only provisional, and is not doctrine, but hypothesis. He notes that certain conditions must be satisfied before the solution is found, and mentions two of the most important. These are that the manifestations of consciousness are conditioned by the brain, and that consciousness remains in complete ignorance of these intracerebral phenomena. This may be explained by the reasons of practical utility which are so powerful in the history of evolution. But, further, the physical properties perceived in an object resemble in no respect the nerve wave which propagates them to and in the brain. His hypothesis is that these properties, if they are in the undulation, are not there alone. "The undulation is the work of two collaborators; it expresses both the nature of the object which provokes it, and that of the nervous apparatus which is its vehicle." The nervous system adds its effect to the external object, and each factor represents a different property. Of these factors, one is variable and the other more constant, and are thus separable by analysis. The consciousness itself is the dialyser, acting "by virtue of its own laws,—that is to say, by changes in intensity." If sensibility increases for variable elements of the nerve undulation, and becomes insensible for the constant elements, the effect will be the elimination of certain of these and the retention of others.

Practice of Pediatrics. Edited by Walter Lester Carr, A.M., M.D. London: Henry Kimpton.

This, the latest addition to pediatric literature, is one of three companion volumes, the other two covering the subjects of obstetrics and gynæcology. The book is edited by Walter Lester Carr, and the various articles are from the pens of a number of American and British pediatrists.

The work possesses some of the advantages and a considerable number of the defects of this system of collaboration. In books of this description there is apt to be considerable overlapping, frequent repetition, and some disagreement between the writers of the different articles, and the present volume is no exception to this rule. As stated on the title-page, the work is one of the Practitioners' Library Series, and is intended more as a book of reference for the busy practitioner than as a text-book for the student. Judged from this standard, the work, as a whole, is disappointing, as while some of the sections are excellent and well repay careful perusal, others are of less than average merit.

The volume is divided into twelve sections, treating of the various systems and of the diseased conditions occurring in children. The line between pediatrics and general medicine has been fairly carefully drawn, and the chief aim of the contributors has been to represent broad clinical pictures of the different diseases, and indications for treatment, to the exclusion of considerations of ætiology or detailed accounts of morbid conditions. The chapters on infant feeding in the hands of Southworth have received adequate treatment, and the descriptions of the modification of milk, percentage feeding, and the determination of food proportions, leave little to be desired.

It is interesting to quote, as emanating from an American source, "that the trend of opinion at the present day is undoubtedly towards the use of fresh clean unheated milk."

There are some excellent chapters on diseases of the heart and vessels, but surely it is an error of judgment on the part of the author to have burdened the pages of a work on diseases of children with a lengthy account of the general symptoms of failure of compensation, and to have devoted so little space to such an important subject as the differential diagnosis between congenital and acquired heart disease.

The infectious diseases are fully and efficiently described, and are beautifully illustrated by a number of exceptionally fine plates.

Taken as a whole, the work is well up to date, and gives a fairly good representation of the present state of our knowledge on diseases of children.

The Essential Similarity of Innocent and Malignant Tumours. By CHARLES W. CATHCART, F.R.C.S. Bristol: John Wright & Co.

THIS valuable contribution to the literature of tumours is the outcome of a prolonged and painstaking study of the subject made by Mr. Cathcart while he was engaged some years ago in preparing the Catalogue of the Museum of the Royal College of Surgeons, Edinburgh. His main thesis has already been set forth in the Lectures he delivered to the Fellows of the College in 1904, a summary of which was published at that time. It is matter for congratulation that he has now put forward his argument in detail, and in a form which renders it capable of being analysed and criticised, not only verbally, but with the aid of a series of illustrations of the naked-eye and microscopic appearances of the material on which he bases his conclusions.

Mr. Cathcart is a whole-hearted supporter of the view that there is an essential similarity in the nature of all varieties of tumour growth, and that a rigid subdivision of tumours into those that are innocent and those that are malignant is not only arbitrary and artificial, but is calculated to lead to errors in our conceptions of the fundamental nature of these morbid conditions. The two classes of tumour, he maintains, are not separate and distinct, either in their histological structure and developmental tendencies or in their clinical aspects, but differ only in degree.

Some important and far-reaching deductions are drawn from this study. It is evident that, if Mr. Cathcart's position is correct, "no theory of the causation of tumour growth can be satisfactory which does not apply equally to innocent and to malignant tumours." It follows, therefore, that the investigations into the cause of cancer, of which we hear so much in the present day, must involve an inquiry into the cause of all tumours, and, as a corollary of this, that the attempt to discover by scientific means a cure for cancer will, if successful, furnish us with a means of treating all other forms.

No one who reads Mr. Cathcart's work with care can avoid reviewing his own opinions on the subject of tumour growth in the light of the argument presented; and although this is one of the subjects on which those who hold opinions adhere to them with great tenacity, we feel sure that, among those who are still open to conviction, Mr. Cathcart cannot fail to make converts.

Surgical Diagnosis: A Manual for Students and Practitioners. By ALBERT A. BERG, M.D., New York. London: Henry Kimpton.

THE method adopted by Dr. Berg in planning the work before us was (we quote the preface) "to give a concise picture of each disease, including its cause, onset, course, and, in certain cases, the accompanying pathological changes." We venture to submit that this is not the way to bring before the student the principles and practice of differential diagnosis, nor is it a plan calculated to help the practitioner out of a diagnostic difficulty. For purposes of diagnosis, the individual signs and symptoms of disease are the units with which we work; and it is only after a careful and comparative analysis of those present, and a consideration of others which may be absent in a given case, that a sound opinion can be formed. The possibility of using these units logically presupposes a knowledge of the different diseases which resemble one another sufficiently closely to be confused; and this knowledge, so far as it is acquired by reading, is properly obtained from systematic text-books. It is true that Dr. Berg has incidentally "indicated the points of difference between the disease under discussion and diseases of other organs which might be mistaken for it," but this does not materially differentiate his work from the ordinary systematic text-book. In fact, if the author had added sections on treatment to those he gives us, his work would have constituted a useful elementary students' hand-book of surgery.

While we feel, therefore, that the author has failed in his intention of furnishing us with a helpful guide to surgical diagnosis, we would not overlook the many good points in his work. Many of his descriptions are admirably clear and succinct; his facts and opinions are seldom open to criticism; and he has, on the whole, included all that is best in modern methods of diagnosis. We miss, however, any reference to the value of Luy's urine separator, while we have a full and appreciative description of cryoscopy, the value of which is now largely discounted. The illustrations, which have been culled from many sources, are numerous, and serve well to illustrate the text. Some would appear to have been selected on account of their grossness, rather than as being typical of what is met with clinically at the present day, but they are none the less impressive on this account.

Anæsthetics: their Uses and Administration. By DUDLEY W. BUXTON, M.D., B.S. Fourth Edition. London: H. K. Lewis.

THIS manual is one of "Lewis's Practical Series," intended as a hand-book for students and practitioners. It is essentially practical, and contains what the author has tested in practice, especial attention being given to dosimetry in chloroform, and the administration of ethyl-chloride as a general anæsthetic. The routine methods of administration with the usual general anæsthetics are well described, and easily understood. *Mixtures* and *sequences* are not apparently so favourably considered by Dr. Buxton as by some other authors, and little space is devoted to them. The terms are not mentioned in the useful index at the end of the book. Ethyl-chloride is stated to be probably less safe than nitrous oxide, and a note of warning is given regarding its administration by the inexpert; but the author believes it to be comparatively safe in suitable cases when properly given. The consideration of spinal anæsthesia is, we think, inadequate as a guide to the practitioner. Probably the author has not made much, if any, use of the method; but at the present time, in a work of this size, it deserves more space than he has devoted to it. The medico-legal aspects of the administration of anæsthetics form the last chapter of this work, and these are concisely put before the reader.

This work is painstaking and accurate in its teaching, but, on the whole, is uninteresting to read.

Transactions of the Medico-Legal Society, Vols. II. and III. London: Baillière, Tindall, & Cox.

THE Medico-Legal Society has fully justified its formation, if one may judge from the excellence of the papers on medico-legal subjects which have been read before it. Many of the contributions are of great practical importance, and deserve to be widely known, such as, for example, in vol. ii., that of Mr. Stanley Atkinson on the "Definition of Accident," "Professional Secrecy and Privileged Communications" by Dr. Bateman, and the paper "On Suicide" by the well-known metropolitan coroner, Dr. Wynn Westcott. In vol. iii., besides papers on "Finger-Print Evidence" by Dr. Garson, on "Medico-Legal Post-mortem Examinations" by Dr. F. J. Smith, and several others of interest, we would call attention to a discussion upon "Consultations among Medical Witnesses previous to Trials," which affords an admirable exposition of the views which have been urged in favour of and against this proposal. We look forward to future volumes with interest.

Pediatrics. By THOMAS MORGAN ROTCH, M.D. Fifth Edition. London: J. B. Lippincott Company.

THE publication of a fifth edition of Rotch's "Pediatrics," treading so quickly on the heels of its predecessor, is sufficient guarantee, if such were required, of the eminence of its author as a pediatric physician. A review of this work having so recently appeared in our pages, we need only briefly refer to the changes in the present volume.

Jealous of his reputation as one of the greatest authorities on the nourishment of infants, and as the pioneer of percentage feeding, the author, in rewriting and bringing up to date the chapters on these subjects, has devoted a large—to many it may appear too large—proportion of space to these topics.

This portion of the work simply bristles with tables of analysis and complicated algebraic methods of calculating the varying percentages to be used in modifying milk for infants at different ages. While granting the high scientific value of these methods, it is open to doubt whether it is altogether desirable to nourish a child in the hard-and-fast percentage system; for it must be remembered that mothers' milk changes in composition from day to day and from hour to hour, and also that the digestive processes in a baby's digestive canal are not altogether comparable to a chemical test tube. It may also be questioned whether any system involving such complicated calculations can ever be generally adopted—at all events, until milk laboratories are universally established.

Several of the other sections have undergone considerable alteration, chief amongst which we would notice the description of the rheumatic state in childhood, which has been rewritten, but which is still capable of much fuller development; the diseases of the gastro-intestinal system, which have been remodelled and classified on an etiological basis; and the diseases of the nervous system, which have been fully revised.

Taken as a whole, the book may be said to give a fairly accurate representation of the present state of our knowledge on the diseases of children; but its reputation will chiefly depend on the chapters on infant feeding. The book is copiously illustrated by numerous engravings and coloured plates, many of which are excellent.

NOTES ON BOOKS.

The Immediate Care of the Injured, by Albert S. Morrow, M.D. (W. B. Saunders & Company, London), differs to some extent as regards its scope from the ordinary book on this subject. It is intended to "be useful alike to physicians, nurses, and laymen, and at the same time serve as a text-book for the use of First Aid classes." Consequently, information on such matters as the method of reducing various dislocations is included, though the author is always careful to insert italicised warnings against such attempts by the unskilled. The first part of the book describes shortly human anatomy and physiology; the second deals with antisepsis, bandaging, dressings, and such remedies as poultices and enemata; while the third part is concerned with ordinary accidents and emergencies, concluding with poisoning, and methods of transport of the injured. The fact that it is intended to appeal to the several classes of readers already mentioned almost necessarily renders portions of it unsuitable for each class, but with that comment the volume can be thoroughly recommended.

In a small book on *The Diagnosis and Treatment of Intussusception*, by Charles P. B. Clubbe (Young J. Pentland, Edinburgh), the author reports his views based upon 144 cases which have come under his own care during the last thirteen years. After some remarks on the pathology, symptoms, and necessity of early diagnosis, he comes to the vexed question of the employment of fluid injections per rectum, with the object of reducing the intussusception. He himself employs irrigation in all cases after the child is under the anæsthetic. Should the tumour disappear, the child may be sent back to bed without operation, but only if the surgeon can see the patient in six hours and operate if necessary. Where complete reduction is not effected by irrigation, the author believes that in most cases the intussusception is very largely reduced by it, and that the amount of intra-abdominal manipulation of the bowel, with its accompanying shock, is correspondingly diminished. As regards the anæsthetic, the opinions of two experts are (perhaps rather unkindly!) brought together in an appendix: one strongly advocates ether, the other chloroform.

In the "Practical Medicine Series" (The Year-Book Publishers, Chicago), which comprises in ten small volumes a synopsis of the year's progress in medicine and surgery, the last volume of the 1906 series is devoted to *Skin and Venereal Diseases*, by W. L. Baum, M.D., and *Nervous and Mental Diseases*, by H. T. Patrick, M.D., and W. Healy, M.D. A short summary is given of the most interesting and important articles which have appeared during the year, and the journals in which they are to be found. The subjects are well chosen and well summarised. The general practitioner can get a bird's-eye view of the work of the year; while the specialist in some other department will find many articles which have a bearing on his own branch of the profession, and which he can follow up in the original magazines should he so desire. One is apt to approach with suspicion a collection of abstracts, but this volume soon convinces one of its usefulness.

The volume of the "Practical Medicine Series for 1906," devoted to *General Surgery* (The Year Book Publishers, Chicago), is edited by Professor John B. Murphy of Chicago, which is sufficient guarantee that the papers selected for review are of practical interest and of scientific value. We concur in the editor's opinion that it is better in a year book of this kind to reproduce the selected articles extensively, rather than merely to furnish brief abstracts of the conclusions. The short pithy editorial comments and criticisms made on many of the papers are most useful, particularly those on the surgery of the abdomen. We may be allowed to express the hope that in future issues of this excellent summary of the year's work there may be a fuller representation of German surgery, which in the present volume receives but scant attention. In a work of this kind we cannot look for literary graces, but it is desirable to avoid a style so slipshod that the meaning is obscured.

A series of seven papers on the focal diagnosis and surgical treatment of *Tumours of the Cerebrum*, which have emanated from the Department of Neurology in the University of Pennsylvania during the last year, are reprinted in book form and dedicated to William Williams Keen and Sir Victor Horsley. The subjects discussed include: the focal diagnosis of operable tumours; the ocular symptoms of tumours of the cerebrum; conjugate deviation of the eyes and head; the significance of Jacksonian epilepsy in focal diagnosis; cerebral decompression; the position and subdivisions of the motor area of the human cerebrum; and the surgical aspects of operable tumours of the cerebrum. The names of the writers—C. K. Mills, C. H. Frazier, Wm. G. Spiller, Geo. E. de Schweinitz, and Th. H. Weisenburg—sufficiently attest the scientific value of these contributions, some of which we have already placed before our readers in abstract. We would only add that the essays here collected bear eloquent testimony to the excellent work done in the Neurological Department of the University of Pennsylvania, and constitute a contribution to the literature of the subject which no worker who desires to be abreast of modern research can afford to overlook.

In the preparation of a second edition of his work on *Retro-peritoneal Hernia* (Baillière, Tindall, & Cox, London), Mr. Moynihan has been fortunate enough to enlist the aid of Mr. J. F. Dobson, who has revised the original monograph, rewritten parts thereof, and incorporated the great body of literature which has appeared on the subject of the peritoneal fossæ and retro-peritoneal hernia since the lectures on which the monograph was founded were delivered in 1897. The extent to which the elaboration of the peritoneal fossa has been carried, and the almost infinite variety of folds and pouches met with, are abundantly shown in the present issue. In its new form this work constitutes a standard source of reference on all matters relating to the anatomy and pathology of the peritoneal fossa and the different varieties of hernia which occur in relation to them.

RECENT ADVANCES IN MEDICAL SCIENCE.

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MEDICINE.

UNDER THE CHARGE OF
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Ehrlich's Research on Trypanosomes.

Under the title "Chemical-Therapeutic Studies on Trypanosomes" (*Berl. klin. Wchnschr.*, 1907, March 4, 11, 18, and 25), Ehrlich has published an important memoir embodying the results of several years' research on the best means of combating infections with trypanosomes. In addition to being of great interest in this particular direction, his observations are extremely suggestive in a number of ways. They throw some light on the nature of the relation of chemical constitution to therapeutic action, and it would seem that some of them may be applicable to protozoal diseases other than trypanosomiasis. The point, for instance, which he raises as to the creation of a strain of protozoa which has acquired the property of resistance to a specific drug, seems to have some bearing on the mercurial treatment of syphilis, which must now, of course, be reckoned among protozoal diseases. Incidentally, too, his observations support the possibility of acquired characteristics being transmissible.

Ehrlich's conception of the relation of chemical constitution to pharmacological action is that it depends on the manner in which drugs distribute themselves in the body. His desideratum is to find chemical substances which are taken up by, and destroy parasites, without at the same time injuring the host. The property of becoming anchored to parasites he calls bacterio-tropism, or ætio-tropism; that of becoming anchored to the cells of the host, organo-tropism. Drugs which exert a specific action must be more strongly bacterio-tropic than organo-tropic. The distribution of drugs on the tissues, however, is an excessively difficult thing to follow out in detail; it is only possible, indeed, in the case of dye-stuffs. The first observations in this direction arose out of the discovery that methylene-blue was a powerful bacterial stain; this led Ehrlich to recommend it as an internal antiseptic, particularly in malaria, and in this disease it has been used with a fair degree of success. This induced Ehrlich to investigate systematically the chemical therapeutics of diseases due to protozoa, and he selected as his subject trypanosomiasis. Many diseases of animals are due to trypanosomes—nagana, tsetse-fly disease, surra, dourine or *mal de coït* of horses, *mal de caderas*, and others. Most of his work has been done with virulent trypanosomes of nagana and *mal de caderas*. In 1904 he tried several hundred drugs fruitlessly before he found one—a red dye belonging to the benzo-purpurin group—which had the property of diminishing the virulence of trypanosome infections in mice. Having made the first step, he called synthetic chemistry to his aid, the result being that a whole series of new dyes belonging to the same group were prepared, and working with these he selected one—trypan-red—as the most destructive to trypanosomes. Trypan-red has a large and very complicated molecule; it is extremely soluble, and stains the tissues of the host a red colour, which fades very slowly. The trypanosome used in the experiments was so virulent as invariably to kill a mouse on the fourth or fifth day after inoculation; a chronic course, or recovery, was never observed. If a mouse received a dose of trypan-red twenty-four hours after infection, at a time at which many trypanosomes can be found in the blood, by the next day all had disappeared. In most cases the animal recovers permanently. It is thus proved to be possible to sterilise the tissues (*quâ* trypanosomes) by a single dose of the remedy. This favourable result was only obtained for one species of animal—the mouse—and for one variety of trypanosome. *T. Brucei*, for instance, was unaffected by trypan-red, though Laveran found that it succumbed to arsenic plus this drug, neither, alone, being effectual. The next point taken up was to improve the efficacy of trypan-red by studying substitution products; the most active of these was the amido-trypan-red, which was accordingly supplied to Koch for use on his expedition to Africa.

Ehrlich next studied the basic trimethyl-methane dyes, of which malachite-green and fuchsin are types. These have the drawback of being, for the most part, too irritating or poisonous to be used, and attempts to find substitution products were, on the whole, unsuccessful. The chief result obtained was to render mice immune to trypanosomiasis by feeding them on bread saturated with para-fuchsin. The relation of chemical constitution to toxicity is discussed at some length, the main conclusion being that the introduction of the sulphuric acid radicle diminishes it greatly, but at the same time renders the members of the series inert so far as any trypanocidal action is concerned.

The third group of drugs studied was the atoxyl series. Atoxyl is an organic arsenic combination, and it and its allies are the most potent agents yet known in treating human trypanosomiasis. Using a virulent strain of nagana, fatal to mice in three days, and injecting on the day after infection the maximum dose of atoxyl which the animals could bear, Ehrlich only succeeded in curing about 5 per cent. of mice. He found that a degree of tolerance for the drug could be obtained and larger doses borne, but even then the drug was not very active. The effects of atoxyl, moreover, varied considerably with different strains of trypanosomes, some being much more sensitive than others to its action. Here again, however, by substitution, Ehrlich succeeded in finding an atoxyl derivative which was much less toxic to mice and correspondingly more destructive to trypanosomes—nearly as efficacious, indeed, as trypan-red. He insists, however, that the results of animal experiment cannot be transferred from one species to another, and that for each species, as well as for each variety of trypanosome, it will be necessary to determine experimentally the most effective remedy.

The second part of Ehrlich's memoir is concerned with more general matters, and chiefly with the question of immunity. In a certain number of cases in which the infection is checked by a dose of trypan-red, there is not a complete sterilisation, but after twenty or thirty days a relapse occurs. To elucidate this, he gave mice which had been infected with trypanosomes and treated with trypan-red a further series of daily inoculations with more trypanosomes. At first there was no sign of reinfection, but about the twenty-third day the organisms began to appear in the blood, and then death took place in the usual three- or four-day period, unless the animals were again treated with trypan-red. There was thus a short period of immunity, which was in so far specific that it did not prevent infection in the usual way with any other variety of trypanosome. The immunity, however, is not specific in the sense that it can be used to differentiate one strain from another; and it will be shown later that what are merely modifications of the same strain can be distinguished from each other by these immunity reactions. The duration of the period of immunity varies a good deal, depending on the virulence of the infection and the resistance of the host. Temporary immunity of this kind, which is an everyday occurrence in many infections, particularly with protozoa (*e.g.*, malaria, relapsing fever, syphilis), Ehrlich calls *Immunitas non sterilizans*; it may culminate in two different directions—(1) The parasites become modified and cease to injure their host. This is observed in Texas fever, in which animals, apparently healthy, continue to harbour the organism and spread the disease. (2) There may be a prolonged period of apparent health, and then, as the immunity wanes, the parasites flourish again and the disease recrudesces.

It follows from this that in most protozoal diseases permanent immunity is much more difficult of attainment than in bacterial infections, and that for its development a prolonged saturation of the body with the parasites, involving many relapses, is needed. Moreover, the immunity attained is not adequate to destroy all the parasites; these appear to alter their biological characters, and become adapted to, and tolerant of, the antibodies which are formed. A species of "half immunity" arises (as in Texas fever aforesaid, and as experimentally produced by Koch with trypanosomes), the host continuing in good health, but harbouring the parasite for years, and remaining a source of infection. Similar prolonged periods of remission have also been observed in patients with trypanosomiasis treated by atoxyl, and probably years must elapse before they can be pronounced absolutely cured. Before even apparent cure is spoken of, large doses of the blood and cerebro-spinal fluid must be injected into susceptible apes without the disease being produced, and even then the possibility that a few quiescent trypanosomes may lurk in the recesses of the bone marrow must be conceded.

Biology of trypanosomes from a therapeutic standpoint.—As we have seen, trypanosomes may be caused to disappear temporarily from the blood by feeding the animal with para-fuchsin, and as they reappear they can again and again be made to vanish by the same means. But in time the few intervals become shorter, and ultimately the drug proves useless. Two possible explanations are—(1) Either the tissues of the host acquire the power of rendering the drug inert, or (2) the parasite becomes tolerant of fuchsin. Now, if some of the parasites which have ceased to be affected by fuchsin be inoculated into a second mouse, it is found that the drug is still inefficacious; the second alternative therefore must be accepted. Ehrlich and his pupils have succeeded in producing strains of trypanosomes which, from having been extremely susceptible to fuchsin, trypan-red, trypan-blue, or atoxyl, have become markedly resistant to one or other of these drugs. Such strains are called trypan fast, fuchsin-fast, atoxyl-fast. Owing to the toxic action of atoxyl on the host, it has been impossible to estimate the maximal degree of resistance to this drug of which the parasite is capable, but the interesting fact was shown that trypanosomes which were atoxyl-fast when the atoxyl was injected, were much weakened, though never quite destroyed, when the host was fed on atoxyl. The drug, therefore, may reasonably be used internally in human trypanosomiasis. When once a trypanosome strain has acquired this property of tolerance, it retains it for long periods—for as many as thirty-six transmissions through different animals. It is apparently an instance of inheritance of an acquired characteristic. Parasites which have acquired tolerance have also gained other biological characters. Thus, if from one common strain, substrains which are atoxyl-, fuchsin-, or trypan-red-fast be produced, and if (say) the trypan-red-fast strain be inoculated into a mouse and its growth checked in the usual way, then, while subsequent inoculations with trypan-red-fast substrains are followed by the usual latent period (*immunitas non sterilizans*), inoculations with atoxyl-fast substrains are at once fatal. Thus each substrain produces a specific immunity.

Atoxyl-fast strains (for example) have no increased resistance to trypan-red; this Ehrlich explains on the side-chain theory, the organism having different receptors for different drugs. Three types of "fast" trypanosomes have been produced—trypan-red and blue, atoxyl, and fuchsin. There seems, therefore, reason in using combinations of drugs in treating trypanosomiasis, since those which resist atoxyl may succumb to the others, and *vice versâ*. On the other hand, there is no object in using both trypan-red and trypan-blue, which seem to act similarly. Another practical point which is indicated by Ehrlich's observations is that it is of the greatest importance to give the drug chosen in large doses as early as possible, so as to sterilise the body quickly. The significance of this will be seen when what has been said as to the development of atoxyl-fast strains is considered. A horse suffering from dourine was treated with increasing doses of an arsenical compound, and, notwithstanding this, died in five weeks. By the end of this time, the parasite, which before treatment succumbed to atoxyl, had become absolutely atoxyl-fast. It is quite possible, therefore, that when cases of sleeping sickness die after months and years of treatment, the failure is due to such resistant strains being developed. It is therefore advisable to test by animal experiment the resistance of the patient's trypanosomes to the drugs employed, and if they are found atoxyl-fast, other remedies should be used.

SURGERY.

UNDER THE CHARGE OF

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Shreds in the Urine.

De Santos Saxe (*N.Y. Med. Journ.*, 1907, March 2) has made an elaborate study of the shreds met with in the urine in a large number of cases of chronic urethritis, prostatitis, and vesiculitis. The routine method in examination finally adopted by him is as follows:—(1) Fix with alcohol and ether for ten minutes; (2) stain for one to two minutes in Unna's polychrome methylene-blue; (3) wash well in distilled water—dry; (4) dehydrate for a few seconds in 95 per cent. alcohol—dry with filter paper; (5) clear in xylol or in clove-thyme mixture—dry with filter paper; (6) mount in balsam. Urethral shreds proper may be divided into four varieties: pus shreds, muco-pus shreds, mucous shreds, and epithelial shreds, each of which has special naked-eye and microscopic characters. Several varieties of altered epithelial cells are found in urethral shreds. Those undergoing hyaline changes may be identified not only by the iodophile reaction, but by a peculiar degeneration as shown by their staining qualities with polychrome methylene-blue. Shreds composed of pure epithelia, consisting of flat pavement cells with small nuclei are shed spontaneously, or after instrumentation, in the stage of the disease in which the superficial layers of the urethra become lined with squamous cells under the influence of subjacent, submucous lesions. Shreds from the prostate and vesicle include several special varieties which can be recognised under the microscope, but cannot be identified with the naked eye. The so-called comma shreds may be of one of two varieties: the true comma shred of Fürbringer consists of hooklets of stratified epithelia derived from the prostatic duct. A false variety is composed of bits of muco-pus shreds which roll up into a lump at one end. The frequency of gonococci in urethral shreds is directly as the proportion of pus cells, and inversely as the proportion of mucus and epithelia, in the specimen. (This rule does not apply to prostato-vesicular shreds.) The study of shreds is not of great value in the localisation of the affection in the anterior or in the posterior urethra. The presence of prostatic or vesicular shreds which can be recognised microscopically is an aid to the localisation of the process. The study of urethral shreds is most valuable in determining the stage of the process, the order of appearance being, with certain reservations,—pus shreds; muco-pus shreds; mucous shreds; and epithelial shreds. In the prognosis the variety of urethral shreds has but a limited use. The fewer the shreds and the fewer the pus cells therein, the better is the prognosis. The larger the number of gonococci and of pus cells, the worse is the prognosis, as a rule. Marriage should not be sanctioned unless the terminal shreds contain no pus cells for months, even after provocative measures such as the drinking of beer. The microscopic appearances of the various forms of shreds are illustrated by a series of micro-photographs.

TRYPSIN IN CANCER—A CAVEAT.

IN a paper, published in the *Med. Rec.*, N.Y., 1906, December 8, Dr. Morton expressed a highly favourable opinion of trypsin in the treatment of cancer, and certain articles by a quasi-scientific writer in the lay press aroused a considerable interest in the subject. Dr. Wm. S. Bainbridge, whose name, against his wish, has been repeatedly quoted in the discussion, writes to correct certain misleading conclusions which have been drawn from a case in which he was concerned. The case referred to is No. 1 in Dr. Morton's article, of which he (Morton) says: "A most remarkable atrophy of an entire cancerous breast ensued"; and "a remarkable process of retrogression by degeneration and atrophy of a carcinomatous breast gland to final and curative obliteration, has been microscopically demonstrated." The facts of this case are now reported by Dr. Bainbridge, who remarks that they "do not warrant the slightest enthusiasm as regards cure." The patient first noticed a lump, about the size of a marble, in her breast in October 1903. The lump alone appears to have been removed, as a radical operation was positively refused (a printer's error renders this part of the report somewhat obscure). The diagnosis of carcinoma was verified by two independent pathologists. In the late spring of 1905 a secondary growth appeared in the breast, and the axillary glands soon became palpable. Operation was again refused, and the patient had thirty-two applications of the X-rays. Eight months later, trypsin treatment was instituted by Dr. Morton. On 3rd November 1906, Dr. Bainbridge performed the radical operation, and shortly after nodules of lymphatic metastasis developed in the neck, and a number of nodules appeared in the skin at the upper part of the wound. Trypsin treatment was again employed, larger doses being given than before. No new nodules developed, and those already present did not materially increase in size. On 22nd January 1907, the nodules were excised.

Dr. Morton's favourable opinion of the value of trypsin is based on the result of the microscopic examination of the parts removed on 3rd November 1906. The parts removed on the 22nd January 1907 were submitted to four independent pathologists, who all reported the presence of actively growing carcinoma.

Dr. Bainbridge, who has used the trypsin treatment extensively, is still hopeful that it may justify its claims, but he pleads for a more scientific consideration of its merits, and meanwhile he maintains an attitude of "suspended judgment."

PERFORATION IN TYPHOID FEVER.

IT is believed that approximately one-third of the deaths in typhoid fever are due to intestinal perforation. Joseph A. Blake (*N.Y. Med. Journ.*, 1907, February 23) estimates that about 10,000 deaths occur in the United States annually from typhoid perforation, and that only about 2 per cent. of the cases are operated upon. As the more recent statistics show that from 25 to 33 per cent. of the cases operated upon are saved, it follows that a very large number of patients are lost annually from what the author calls "improper treatment." It is admitted that the diagnosis of perforation is often extremely difficult, but reliance can usually be placed on the sudden onset of severe abdominal pain, accompanied by localised tenderness, and, most important of all, muscular rigidity, particularly in the lower right quadrant of the abdomen. If these symptoms are associated with a sudden change for the worse in the patient's condition, sweating or shivering, rise in the pulse rate, and a fall in the temperature, the indications for operation are sufficiently clear.

Blake does not consider the presence of shock a contra-indication to operation, but rather the reverse, as the shock usually passes off as soon as the patient is anæsthetised. He prefers general anæsthesia to local, as it diminishes the shock, causes complete relaxation of the abdominal muscles, and admits of the peritoneal cavity being thoroughly washed out. The incision is made through the outer third of the right rectus muscle, the perforation sought for in the lower part of the ileum or in the cæcum, and when found closed by three tiers of Lembert sutures. Resection should be avoided if possible. The abdomen is thoroughly flushed out with saline solution, and drained. Relapses are not uncommon after perforation. In the last five years in the Roosevelt Hospital there were thirty-three patients with perforation, twenty-one of whom were operated upon, with seven recoveries,—a mortality of 60·6 per cent. Of the twelve not operated upon, all died.

On the Origin and Nature of Traumatic Serous Effusions.

Considerable difference of opinion exists as to the origin and nature of the serous effusions that follow immediately after an injury. Four views have been put forward—(1) That the fluid is derived entirely from the blood, and that it escapes from ruptured capillaries and small vessels; (2) that it is of lymphatic origin, escaping from ruptured lymphatics; (3) that it is derived from damaged connective-tissue elements; and (4) that it is inflammatory in nature. Mercadé and Lemaire (*Rev. de chir.*, Paris, 1907, March) have studied the cytology of these effusions, and are able to refute the connective-tissue and the inflammatory theories. The presence of blood cells they account for by incidental rupture of small vessels, but they conclude that the great bulk of the effusion is due to traumatic rupture of lymphatic vessels.

OBSTETRICS AND GYNÆCOLOGY.

UNDER THE CHARGE OF

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THE VARIOUS TYPES OF CARCINOMA OF THE CERVIX UTERI.

J. A. SAMPSON (*Johns Hopkins Hosp. Bull.*, Baltimore, 1907, January) describes the various forms of cancer of the cervix uteri, with many excellent illustrations. Cases of cancer of the uterus give a history of a bloody discharge in 93 per cent. Women should be educated as to the importance of this symptom. Following the types of epithelium of the cervix, the carcinoma may be of squamous-cell or cylindrical-cell type (adeno-carcinoma). These growths may occur either on the vaginal portion of the cervix, or within the cervical canal. Both may be vegetative (cauliflower) or infiltrative (ulcerative) in form. The squamous-celled growth arising from the vaginal surface of the cervix is the most easily diagnosed and the least malignant. The difficulty of diagnosis and the malignancy is greater in the infiltrative forms. Most malignant of all is the adeno-carcinoma of the cervical canal.

THE STEM PESSARY FOR AMENORRHŒA AND DYSMENORRHŒA.

J. H. CARSTENS (*Journ. Am. Med. Ass.*, Chicago, 1906, December 29) advocates the use of the stem pessary in cases of amenorrhœa with infantile and atrophied uterus, believing that while the pessary is worn the irritation causes muscular contraction, from which muscular development results. He prefers the stem pessary to dilatation in cases of dysmenorrhœa due to stenosis or to the fibrous atrophy which is met with in unmarried women. The uterus is dilated and curetted under an anæsthetic, and the Hodge-Thomas pessary inserted, to be worn from three months to a year. An absolute contra-indication, however, is the existence of active or latent pelvic inflammation.

THE TREATMENT OF OVARIAN PROLAPSE BY SHORTENING THE OVARIAN LIGAMENT.

BONNEY (*Trans. Obst. Soc. London*, 1906, December) describes a simple operation by which he shortens the ovarian ligament in cases of ovarian prolapse. When symptoms are due to displacement of the ovary alone, he does nothing else; where the uterus is also out of its normal position, both must be put back into position. In chronic ovarian and tubal disease he first frees the ovary from the tube, and then shortens the ovarian ligament.

Temperatures occurring during the Puerperium.

Ryder (*Surg. Gynæc. and Obst.*, Chicago, 1907, January) discusses fever during the puerperium under the following forms :—(1) Reactionary temperature ; (2) temperature from distended breasts ; (3) temperature due to mastitis ; (4) fever due to pyelitis ; (5) fever due to toxæmia. Those forms are fully described with illustrative charts. Ryder emphasises the fact that no effort should be spared to find and remove the cause of any temperature occurring during the puerperium. Examine first the breasts and uterus. Any tenderness over the fundus, and its height above the pelvis, should be carefully noted. The vulva, cervix, and perineum ought to be inspected, followed, if necessary, by examination of the urine and blood. In obstetrics, hæmorrhages may be checked, lacerations sutured, but sepsis must be prevented.

Primary Carcinoma of the Fallopian Tube.

Kundrat (*Arch. f. Gynäk.*, Berlin, Bd. lxxx. Heft 2) describes two cases of primary carcinoma of the Fallopian tube. Metastases were found in the ovary, pelvic glands, uterus and adnexa of the opposite side. The epithelium found in tubal carcinoma is ciliated, the cell irregular in form, and the nucleus dark, irregular, and often entirely filling the cell. In the author's cases villi with hyaline degeneration were seen. The connective tissue was composed of round cells, poor in nuclei, and, where it penetrated, the new growth presented a highly degenerated hyaline structure.

Removal of the Head when retained in the Uterus after Separation of the Trunk.

Borgins (*Deutsche med. Wchnschr.*, Leipzig, 1906, No. 42) recommends that the head should be grasped with a strong volsella, or forceps, so that by means of a weighted cord fastened to the end of the instrument and hung over the end of the bed dilatation may gradually be brought about, and the head subsequently delivered by traction on the forceps. He describes a case in which the head was used in this way to dilate the cervix for twenty-four hours, with a successful result.

Drainage in Uterine Surgery.

Panchet (*Arch. prov. de chir.*, Paris, 1906, No. 10), in discussing how best to drain the pelvic cavity after operations on the uterus and appendages, gives the following rules :—(1) After septic laparotomies and hysterectomies it is possible and necessary to drain by the vagina ; (2) after slightly septic laparotomies suprapubic drainage is advisable ; (3) when the wounded soft parts of the pelvic cavity cannot be protected by peritoneum, wicks or gauze should be used for drainage. In the majority of cases, drainage is best carried out by a stiff rubber tube inserted through a small counter opening external to the original abdominal wound.

The Technique of the Induction of Premature Labour.

Planchu (*Lyon méd.*, 1907, No. 4, tome cviii. p. 144) discusses the relative advantages and disadvantages of the induction of labour by the bougie and dilating bag. The objections to the former are its uncertainty, the risks of accidental rupture of the membranes, and wounding the circular sinus of the placenta. Of the dilating bags that of Champelier de Ribes is most commonly used. Planchu thinks it is much too large, and thereby causes undue distension of the lower uterine segment, and tends to displace the presenting part. A smaller bag acts not so much as a dilator as an excitor of uterine action, labour pains commencing on an average two hours after the introduction of a bag about the size of a small orange, and capable of containing about 150 to 180 c.c. of boiled water. The technique is given in detail; the chief points being that the cervix is dilated sufficiently to admit the forefinger, the membranes are separated, and the empty rolled up bag is introduced with the fingers, and filled with sterilised water.

Pyelitis complicating Pregnancy.

Swift (*Boston Med. and S. Journ.*, 1907, February), in reporting three cases of this condition, refers to Rebland's paper published in 1892, where he draws attention to the subject by reporting five cases—three ante-partum, two post-partum. The symptoms common to all were pain in the side (usually the right), increased frequency of micturition, elevation of temperature, and pus in the urine. About all the cases studied bacteriologically show the *Bacillus coli* to be the cause of the trouble. Swift has collected forty-one cases. Of those, fifteen were primiparæ, fourteen multiparæ; not mentioned eleven. The right side was affected thirty-seven times, the left four. Twenty-eight cases went to full term. Spontaneous premature labour occurred four times, premature labour was induced once, and in nine cases, the pus having disappeared from the urine, the patients passed from further observation. Nephrotomy was done once ante-partum, four times post-partum. The colon bacillus is reported seventeen times; no bacteriological examination is recorded in the remaining cases.

THERAPEUTICS.

UNDER THE CHARGE OF

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Serum Treatment of Cerebro-Spinal Meningitis.

Jochmann has carried out a series of experiments to find out whether it is possible to produce a serum which will prove useful in cerebro-spinal meningitis. He employed numerous strains of cocci obtained from different cases. The organism varies much in virulence, but by using the most virulent forms he was able to produce a polyvalent serum which exerts distinct agglutinating and therapeutic properties. Horses were treated first with subcutaneous injections of killed cultures, followed by intravenous injections. Subsequently injections of living cultures were employed. Eventually a serum is obtained which possesses high agglutinating properties, which proved very useful as a sero-diagnostic test for doubtful forms of cocci. Using it, he was able to show that the meningococcus is frequently present in the naso-pharyngeal tract of apparently healthy individuals. He demonstrated them in seventeen out of twenty-four healthy people. The intraperitoneal injections of serum confers protection to mice against six times the ordinary lethal dose of cocci. The simultaneous injection of serum and cocci is also antidotal. The mode of action of this protection is not absolutely certain. The toxin is endo-bacterial, since the killed germs are more fatal than living cultures. The serum exerts no direct anti-bactericidal action, since contact with it for twenty-four hours does not prevent the subsequent growth of the cocci. On the other hand, the addition of fresh complement to the serum, in the form of a trace of fresh horse serum, results in a retarding action on growth; and, similarly, the insertion of a closed capsule, containing the cocci in the peritoneum of a passively immunised animal, is accompanied by delayed growth. Hence the fluids of an immunised animal must contain some substance which inhibits growth. In this last experiment the direct action of leucocytes is excluded, but another type of experiment shows that under the action of the serum the phagocytic action of leucocytes is increased, so that the serum seems to contain a large quantity of bacteriotropic substance.

Therapeutic observations on human beings show that the use of the serum is followed by a fair measure of success. Large doses of 20 c.c. are necessary. This may be given subcutaneously, and also directly injected into the spinal canal. If the fever returns, these injections may be repeated. Of seventeen patients treated thus, only five died. Of the others, in nine cases (of which six received intradural injections also) the injection was followed by definite, permanent fall of temperature. In two cases the temperature was increased for about twenty hours before it fell. In other three cases there was only a temporary fall of temperature. In many cases the injection was followed by marked lessening of the headache and stiffness of the neck, while the patients became much clearer mentally. To relieve the intradural pressure the serum treatment may be associated with repeated spinal puncture. In no case has the injection of this quantity of serum caused any inconvenient symptoms, as local irritation, rash, or albuminuria.—*Deutsche med. Wchnschr.*, Leipzig, 1906, No. 20.

TREATMENT OF CEREBRO-SPINAL MENINGITIS.

VORCHÜTZ recommends the treatment of this condition by a combination of repeated puncture and venous congestion. He punctures the spinal canal whenever there is any indication of cerebral pressure, and also if the temperature shows any tendency to rise. The venous congestion treatment is found to relieve the headache very markedly. The pressure of the bandage is slight, so that the face becomes only slightly congested. It is not necessary to produce œdema or protrusion of the eyeballs. The bandage is kept on for twenty hours at a time, and spinal puncture is not performed while the bandage is applied. The patient finds great relief from the application of the bandage.—*Muenchen. med. Wchnschr.*, 1907, March 12 and 17.

The Treatment of the Heroin Habit.

Heroin is closely allied in chemical composition to morphine. Pharmacological experiments on animals show that heroin is rather more toxic than morphine. It differs from morphine in its greater tendency to cause convulsions, rather than cerebral depression. Despite these disadvantages, heroin has been very largely employed as a substitute for morphine, both as a depressant of the respiratory centre and for alleviating pain. The effect of heroin is not lasting, and it is necessary to increase the dose to maintain the effect, and a drug habit is rapidly established. In the treatment of the morphine habit the substitution of heroin has frequently been attended with disastrous results, as a new craving is established. Of sixteen cases of heroin craving, which Duhem has investigated, three developed the craving after using the drug in asthma, four were morphino-maniacs, who were treated by substitution of heroin. In three instances the heroin was originally prescribed for a painful affection, and the remaining six cases gave different accounts of mental instability which had induced them to use the drug. It is interesting to note that when used for its antispasmodic effect in asthma, or respiratory disease, the dose reached is much larger than when employed for the analgesic action. In one instance the patient took as much as 22 grs. as a dose. When employed as a substitute for morphia, large amounts are also reached.

In breaking the patient of the habit of taking the drug, a plan similar to that employed with the morphine habitue is followed, but the effect is more risky and variable. The patient is isolated, the gastro-intestinal excretion is regulated, and the dose of heroin is rapidly diminished, till at the end of six or seven days the drug is completely stopped. Certain peculiarities are to be noted. Whereas with morphino-maniacs it is expedient when diminishing the dose to continue to use morphine, in heroino-mania the continued use of heroin is unsuccessful; it is better to substitute morphine injections. For if, during the cutting off period in a morphino-maniac, any cardiac embarrassment develops, the injection of a very small quantity of morphine is sufficient to relieve the distress, with heroino-maniacs the similar employment of heroin is not successful, whereas the substitution of morphine gives immediate relief. Consequently the best routine practice is to cut off all heroin at the commencement of treatment, and employ only morphine during the period of diminution of dose. Even with this precaution it is rare for the deheroinisation to be effected without some disturbance. Failure of respiration is usually the stumbling-block. When the dose is being diminished, an insidious failure of respiration is frequent, and as the onset is very gradual, great care has to be observed that the patient is kept constantly under observation. The patient appears to be quite easy, lies on his back, with good pulse and respiratory movements, when without warning the respiration ceases, the patient turns pale, the eyelids twitch, the face becomes covered with a cold sweat, and the patient loses consciousness. Energetic stimulant treatment and injection of morphine is necessary to restore the patient. The subsequent convalescence is much slower with heroin than with morphine, and it takes the patients several weeks to regain their proper weight.—*Progrès méd.*, Paris, 1907, February 23.

Trypsin Treatment of Cancer.

Graves has treated systematically four cases of cancer by subcutaneous injections of trypsin, and has obtained results which are typical and instructive. The cases chosen were well adapted for testing the efficacy of the treatment, as all that could be done by surgical methods had already been carried out. The patients were all in fairly good health, and the fact that the secondary growths occurred as small isolated nodules underneath the skin rendered it easy to observe any gross alteration under treatment. A number of the growths were excised under cocaine for microscopic examination. The technique employed consisted in injecting a glycerin preparation made by Fairchild called injectiotrypsini. Commencing with 10 minims, this dose was increased to 40 minims thrice weekly. If the injection be made in divided quantities, this dose may be increased to 60 minims, as the tissues soon acquire a certain degree of tolerance. The amount and frequency of the dose must be regulated by the local and general reaction of the tissues. Despite the large dosage, Graves had only one case in which the constitutional reaction was great. There was always a certain amount of local reaction, consisting of a dense hard infiltration, which was seen microscopically to depend upon a great infiltration of small round cells into the subcutaneous tissues. This reaction passes off in a few days. The curative action is summarised as follows. Under local injection a discrete cancerous mass shrinks and disappears. The action is strictly local, as neighbouring nodes are little affected, unless the trypsin comes into actual contact with them. The treatment does not prevent the subsequent appearance and growth of fresh nodules in the same area. The evidence is, therefore, that trypsin acts only as a local remedy by direct contact, and there is no reason to believe that it exerts any action through the blood. This is further borne out by the fact that oral administration has no action on the growth, but the general health is slightly improved in so far as digestion is helped. Graves considers that his results are sufficiently good to warrant him in recommending the treatment in inoperable cases of cancer.—*Boston Med. and S. Journ.*, 1907, January 31.

PATHOLOGY AND BACTERIOLOGY.

UNDER THE CHARGE OF

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The Form of the Red Blood Cells of Man.

The biconcave disc shape of the red cells has been so long and so generally accepted that it is surprising to find it questioned. Radasch does so (*Proc. Path. Soc. Phila.*, 1906, No. 6, p. 139). In examining a series of slides of tissues derived from fœtuses, he noted the constant presence of numerous red cells not possessing the classical biconcave shape. The tissues were fixed in Heidenhain's solution (*a* 0·5 per cent. NaCl solution saturated with $HgCl_2$). The spleen, liver, kidneys, lungs, and placenta were examined. The last-named gives an opportunity of examining the red cells of the mother and of the fœtus at the same time. He holds that—(1) The majority, if not all, the circulating red cells are bell-shaped and not biconcave. (2) Upon contact with the air, the bell-shape is changed to the biconcave, the result of collapse. The contrast picture can be got by the fixation of blood (1) which has not been exposed to the air, (2) which has been so exposed.

The Proportioning of the Active Substances of Hæmolytic Serums.

Remy (*Bull. Acad. roy. de méd. de Belg.*, Bruxelles, 1906, October 27 and November 24, p. 879) continues his studies in this subject. His preceding paper was published in the *Ann. de l'Inst. Pasteur*, Paris, 1905. It showed that—(1) The intensity of hæmolysis is proportional to the doses of hæmolytic serum used; (2) in presence of an excess of one of the two constituents of serum (complement or immune body), the intensity of hæmolysis is proportional to the doses of the other constituents; (3) in presence of a sufficient quantity of red cells and a minimum dose of one of the two constituents able to cause hæmolysis, the intensity of the hæmolysis is proportional to the doses of the other constituent. He performed a large number of experiments for the purpose of determining the accurate proportioning of the two substances, and gives his results in the present paper. They can be classified in three ways according to the point of view adopted. (*A*) If the hæmolytic power of the serum in the course of vaccination against red cells be considered, then one general conclusion can be made, namely, the serum of animals of different species vaccinated against red cells attains its maximum power after a definite number of injections, which if exceeded may lower the hæmolytic action. This maximum of injections varies according to the species of animals, and to the nature of the red cells injected. (*B*) What is the mechanism of the increase? (1) The quantity of complement undergoes only slight modifications in the course of vaccination; (2) the immune body is considerably increased in the course of immunisation against red cells; (3) its production is not unlimited. It shows at first an ascending curve parallel with the number of injections until it reaches a maximum, then it falls proportionate to the continued number of injections. (*C*) From the point of view of proportioning the hæmolytic complement in the serum, he finds —(1) The number of injections which produce hæmo-immune body is important. A maximum quantity is reached after a given number. If this number be exceeded, the quantity of hæmo-immune body diminishes. It varies with the animals employed. Four is the number in the case of guinea-pigs and rabbits vaccinated against the blood of the fowl, six in guinea-pigs injected with the blood of the rabbit. (2) Very active hæmo-immune body must be used for the proportioning of hæmolytic complement. (3) The most simple case for the proportioning of the complement is furnished by a serum which normally is deprived of hæmolytic properties against red cells. This is seen in the serum of the guinea-pig vaccinated against the blood of the rabbit. It suffices to place in the presence of a sufficient number of red cells and of a constant quantity (0·5 c.c. of hæmo-immune body), variable quantities of the same serum, or a constant dose of different serums. The intensity of hæmolysis will be in this case chiefly proportional to the amounts of the complement present in the reactions.

THE DISTRIBUTION OF TREPONEMA PALLIDUM (SPIROCHÆTA PALLIDA OF SCHAUDINN) IN THE TISSUES IN CONGENITAL SYPHILIS.

SCHULTZ (*Journ. Med. Research*, Boston, 1906, December, p. 363) examined very carefully two cases of congenital syphilis. He followed Levaditi's method of the silver nitrate impregnation, in bulk, of formalin hardened tissue, followed by reduction by means of pyrogallic acid. The tissue is then embedded in paraffin, and the sections stained with toluidin-blue. In the one case the entire body was flooded with spirochætæ, while the local lesions were slight, a condition comparable to a bacteriemia, in which death occurs before there is time for the development of marked pathological lesions. The liver showed the most marked changes. In the second case the numbers of spirochætæ were much fewer, probably due to the lighter nature of the infection. Like other observers, he found that the spirochætæ were present in small numbers only in the placenta. On the whole, his two cases confirm the findings of Levaditi, of Buschke and Fischer, of Mucha and Scherber, of Herxheimer and Opificius, of Gierke and of Paaschen. In sections the organisms have the same characters as in smears. It is an intracellular parasite, glandular epithelium being particularly vulnerable. The connective-tissue new formation, so characteristic of syphilis, is due in part to this destruction of parenchyma cells, in part to a stimulation of the connective-tissue. In those cases of congenital syphilis in which the mother is diseased, infection occurs by way of the placental circulation. Multiplication of the parasite occurs chiefly in the perivascular lymphatics, and within the tissues themselves; not within the larger blood vessels. The periarteritis which occurs in syphilis is due to this perivascular localisation of the organism. The protozoal nature of the organism, although not proven, seems probable.

HÆMORRHAGIC HEPATITIS IN ANTITOXIN HORSES.

LEWIS (*Journ. Med. Research*, Boston, 1906, December, pp. 449–467) gives the results of his observations on eleven antitoxin horses. Such animals may be kept for a long time producing antitoxin if they are not bled more severely than 5 litres per 1000 lb. each three and a half to four weeks. After the treatment has continued long enough to develop amyloid degeneration of the liver, increasing the frequency of the bleeding risks killing the animal. Amyloid degeneration of the liver and less frequently of the spleen is produced in a majority of horses by the routine treatment with diphtheria toxin and repeated bleeding extended over a period of three years. The longer the treatment is continued, the greater the certainty of the onset of the amyloid disease. Horses with amyloid degeneration of the liver are very subject to hæmorrhages into the liver substance, and to rupture of the organ with hæmorrhage into the peritoneal cavity. The larger hæmorrhage very possibly results from an extension of intralobular hæmorrhagic infections, which are probably directly induced in the already diseased liver by the disturbances in the circulation incidental to bleeding. When the hæmorrhage does not break through the surface, it is either encapsulated, resulting in a blood cyst, or absorbed and organised, resulting in pigmented cirrhosis. Regeneration of parenchymal and bile duct epithelium is attempted in the late cases.

THE ANAEROBIC BACTERIA IN MAN.

LEINER (*Centralbl. f. Bakteriol. u. Parasitenk.*, Jena, Originale, Bd. xliii. 1906, December 22, SS. 7–16; 1907, January 17, 119–130) adds a contribution to our knowledge of this subject in cases of diphtheria. He opens with a long description of the germs which have been found in cases of diphtheria associated with Löffler's bacillus, and then gives his own observations. He found a great disproportion between the number of germs present in a direct examination of the false membrane, and that after inoculation of Löffler's serum, he searched for anaerobes, particularly for septic forms in cases where the false membrane had a nauseous odour. He paid special attention to a fine bacillus which he isolated from many cases of diphtheria. It varied in numbers, was Gram negative, and seemed to be of the same shape as that described by Bernhein in diphtheria, and quite distinct from the *Bacillus fusiformis* of Vincent. It is a vigorously anaerobic bacillus, and, like most of its congeners, polymorphous. It grows only at the body temperature (37° C.), but in all media. It gives off a nauseous odour similar to that exhaled by patients suffering from septic diphtheria. He does not think that it is specific for diphtheria, since it is present, although in small numbers, in scarlatinal sore throat, and is absent as a rule in mild forms of diphtheria. He thinks that it is a saprophyte, which, under circumstances still undetermined, decomposes the false membrane with the production of its particular odour.

THE INFLUENCE OF INFLUENZA ON THE EVOLUTION OF OTHER INFECTIOUS DISEASES.

LIVIERATO (*Centralbl. f. Bakteriol. u. Parasitenk.*, Jena, 1907, Originale, Bd. xliii. January 17, SS. 131–140) killed a culture of the influenza bacillus by ether, and designated it the influenza toxin. He injected it along with the pneumococcus of Fränkel, the pneumo-bacillus of Friedländer, the bacillus of Eberth or that of Koch, into different animals, *e.g.* guinea-pigs, rabbits, dogs. He found that the influenza toxin exaggerated the toxic effect of these germs. Injected along with a feebly pathogenic germ such as the pneumococcus in the guinea-pig, or the typhoid bacillus under the skin of the rabbit, it caused an acute illness. In combination with the tubercle bacillus particularly, it caused the latter to take on a much more rapid course, and caused death much sooner than when it was absent. Not only did the influenza toxin exalt the acuteness of other maladies, but it also favoured the subsequent development of other germs, which explains the frequency of secondary infections in cases of influenza in the human subject.

DISEASES OF THE EAR, NOSE, AND THROAT.

UNDER THE CHARGE OF
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The Treatment of Labyrinthine Vertigo and Tinnitus by Lumbar Puncture.

J. Babinski again considers this subject (*Ann. d. mal. de l'oreille, du larynx, etc.*, Paris, 1907, February). A previous paper appeared in the same journal in February 1904. He has made a number of observations upon the effect of withdrawing some of the cerebro-spinal fluid by lumbar puncture in cases of giddiness due to a labyrinthine affection, while he has also noted the effect of the same operation upon the associated tinnitus and deafness. As he regards the procedure as free from risk, and as it has never increased the symptoms for which it has been employed, he considers such an experimental method justifiable. He exercised, however, great care, only withdrawing a small quantity of the fluid and keeping the patients very quiet after the operation. At first only 4 or 5 c.c. were withdrawn, then 15 or 20. In a great number of patients, a single puncture only was made, but in several, two, three, or even more, at more or less long intervals. The patients were advised to keep the horizontal position if they had any symptoms of headache or nausea.

Altogether 106 patients were thus treated. Of the three symptoms—vertigo, tinnitus, and deafness—the first is the one most frequently influenced by the withdrawal of the cerebro-spinal fluid. Of the 106 patients, thirty-two were affected with giddiness, and of these eleven had no relief after the operation. In the remaining twenty-one a very fair result, sometimes quite a remarkable one, was obtained. Of these, seven, affected with vertigo, were free from symptoms for at least six months, and one of them for thirteen months. In a second group, there were four patients in whom the relief had been maintained for about three months.

Tinnitus proved much more rebellious to treatment. Of ninety, there were about thirty in whom this symptom had been sensibly diminished or had disappeared, and of these latter there were ten in whom the improvement had lasted for three months or less; some even were free from their noises for seven, ten, and thirteen months, though there were twenty others in whom amelioration had not lasted for one month. As regards the deafness, the treatment is still less satisfactory. In 100 cases, there were only thirteen in which any improvement was obtained. As general conclusions, the author states that lumbar puncture appears to have a remarkable influence upon giddiness, but that its usefulness is limited in tinnitus and deafness. It is certainly of more value in pure labyrinthine affections than in those where there is a combination of middle and inner ear disease.

LOCAL ANÆSTHESIA IN AURAL OPERATIONS.

A CONSIDERABLE amount of work has been done with the object of improving the methods of inducing good local anæsthesia for minor operations upon the ear. Bonain, who has already written upon this subject, again draws attention to the method employed so satisfactorily by himself (*Rev. hebd. de laryngol.*, Bordeaux, 1907, March 9). He uses the following mixture: carbolic acid, menthol, and cocaine hydrochlorate, of each 1 grm., and adrenalin chloride, 1 mgrm. The addition of adrenalin allows the cocaine to act better upon inflamed tissues, upon which generally it has very little action. This mixture has the advantage of being sufficiently hæmostatic to allow one to operate upon the tympanic cavity without causing bleeding. He lays some stress upon his method of applying it, preferring its application by means of a small piece of cotton-wool soaked in the mixture and left against the tympanic membrane for three to five minutes. He also mops the walls of the meatus with it, getting in this way the benefit of the antiseptic action of the mixture. Where granulations are to be removed from the tympanum, the cavity is carefully mopped in the same way. Amongst other operations for which he obtains local anæsthesia, he mentions the removal of nasal polypi, cauterisation of the tuberculous larynx, pharyngeal abscess, and submucous resection of the nasal septum.

REMOVAL OF FOREIGN BODIES FROM THE LOWER AIR PASSAGES.

Two recent papers dealing with the extraction of foreign bodies from the lower air passages merit recording, as the subject is treated in two different ways in the two papers. In the first (*Ann. Surg.*, Phila., 1907, March) Goeltz describes the removal of a button from the right bronchus by the operation of anterior thoraco-bronchotomy. The patient was a lad about 7 years of age, and as the result of inspiration of the foreign body, severe attacks of coughing, dyspnœa, and cyanosis were induced. A low tracheotomy was performed, and the body was located in the right bronchus by means of a probe passed through the tracheotomy wound. Attempts to remove it by this route were made with forceps, wire loops, and curettes. These failed, the body being apparently imbedded in the bronchus and surrounded with swollen mucous membrane.

The thorax was then opened on the right side in front through an osteoplastic flap made by breaking the third and fourth ribs from their sternal attachment. The lung underneath was found collapsed, and the button could be easily palpated through it. There was slight movement of the bronchus with the respiratory act, but an assistant hooking his finger under the bronchus easily controlled the movements. An incision was made through the overlying lung into the bronchus, and the button grasped and removed; no drainage was used, and the flap was stitched in position. Recovery gradually took place; the collapsed lung expanded, the boy being taught to blow water from one bottle to another in order to bring this about.

The other paper is a recent communication by Killian upon the value of tracheo-bronchoscopy in the detection and removal of foreign bodies from the air passages (*Laryngoscope*, St. Louis, 1906, December). Killian's work upon the extraction of foreign bodies *per vias naturales* is too well known to require any detailed description here, but statistical analysis shows that by means of the bronchoscope, introduced either through the mouth or through a tracheotomy wound, the presence of a foreign body can be definitely ascertained. Attempts at removal carried out in the same way are successful in nine-tenths of the cases. Save in those cases where there may be a high degree of stenosis of the bronchus above the foreign body, or where sometimes a small foreign body may be deeply lodged, pneumotomy is not necessary, and the bronchoscope suffices. Killian himself prefers to introduce the tube through the mouth rather than through a tracheotomy wound. The latter operation should only be done in cases of necessity, as, for example, where urgent dyspnœa is present, or where serious complications, more particularly in the lungs, have already set in, and materially reduced the patient's strength. Further, where the foreign body is unusually large or of irregular shape, pointed and sharp, so that in an attempt at extraction difficulty may arise in, or injury be inflicted upon, the larynx. The majority of cases, from two-thirds to three-fourths of the whole number, ought to be treated by upper tracheo-bronchoscopy, which must now be regarded as the established method. In spite of the greater difficulties in passing the tube through the mouth, successful extractions have been carried out in thirty-three out of forty-six cases.

In the latter part of his paper, Killian discusses the question as to how bronchoscopy may assist in the surgery of the lung. The focal affections of the lung form an object of surgical interference, and this depends upon the power to recognise such foci early, to ascertain their nature, and to localise them accurately. To this end bronchoscopy can be of assistance if the diseased parts stand in relation to the bronchial tree and especially to its lumen. It depends upon whether in larger bronchi accessible to the eye, changes in the wall, perforations, adhesions, and such-like, have already occurred, or whether there are surface areas upon the mucous membrane, which are in a pathological condition, from which secretion is being discharged. The observer may be able to determine from which bronchial branch secretions come, and then locate them anatomically. He must, of course, have an accurate knowledge of the bronchial tree as seen from within. He must commence from the bifurcation of the trachea, and carefully note the openings of the chief branches during the downward passage of the tube. If the anatomical relationship of the affected bronchial branch is known, the part of the lung is thereby located in which the focus in question lies. To each bronchus belongs a conical-shaped patch of lung tissue, into whose apex the bronchus passes, and whose base lies on the thoracic wall. The position of the base on this wall fixes at the same time the place from which the focus may be reached surgically. A development of this method of research may lead to better localisation in thoracic surgery.

PUBLIC HEALTH.

UNDER THE CHARGE OF

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The Bacteriology of Fish.

Ulrich (*Ztschr. f. Hyg. u. Infectionskrankh.*, Leipzig, vol. liii. S. 176) gives the results of an investigation conducted by him with regard to the bacteria to be found in fish, both in the raw and in the cooked state. This investigation was suggested by the occurrence in Zurich of several cases of poisoning attributed to the eating of fish. The members of two families were affected, the symptoms being those of gastro-enteritis and typhoid. The fish were not cooked for some days after being caught, and were not eaten till from twenty-four to forty-eight hours after cooking. The symptoms were more severe in those who partook of the fish which was kept for the longer time after cooking. This circumstance, together with the fact that some other fish placed on the same dish beside the suspected fish also became infected, suggested a bacterial poison as the probable cause of the symptoms. *B. paratyphosus* (*B. Schottmüller*) was isolated from the blood in two of the fatal cases, and the blood of four of the cases gave a positive agglutinative reaction when tested with that organism. Bacilli of the *Proteus* group have been found in cases of fish-poisoning, but owing to the symptoms Ulrich thought that members of the *Coli* group might be the cause, and with this in view he made an elaborate investigation on various kinds of fish bought as fresh as possible, including white fish, barbel, carp, salmon, tench, etc. The chief points investigated were—(1) The micro-organisms to be found in fish at different temperatures; (2) their growth in fish, both raw and cooked; and (3) the persistence of pathogenic organisms in the fish, and their degree of virulence. His conclusions are briefly as follows:—

1. The number of micro-organisms in raw fish at ordinary temperatures is very considerable. They belong to two groups, namely—(*a*) *B. coli* group, and (*b*) *B. proteus* group. Bacilli of the *Coli* group are the more numerous, and grow better in raw fish than those of the *Proteus* group. The bacilli of the *Coli* group, of course, do not liquefy gelatin, while those of the *Proteus* group do.

2. Fish cooked in the ordinary way is not rendered sterile by cooking, and as the cooked fish forms a very good nutrient medium, the micro-organisms multiply in it enormously, especially at high temperatures. In cooked fish, as in raw fish, organisms of the *Coli* group are more abundant than those of the *Proteus* group.

3. Feeding animals with raw and cooked fish infected with *B. paratyphi* (fish), failed to demonstrate definitely whether the fish was more or less virulent in the cooked or in the uncooked state, but subcutaneous injection into mice, rats, and guinea-pigs of broth made from cooked fish and infected with *B. paratyphi* caused a fatal result sooner than injection of a watery infusion of raw fish similarly infected.

4. *B. paratyphi* grows well in cooked fish, but animal experiments showed little if any difference in virulence between fish inoculated with *B. paratyphi* and that not so inoculated.

5. *B. proteus*, he finds, increases rapidly in cooked fish, and gives rise to the characteristic unpleasant smell of fish "gone wrong."

6. He considers that as micro-organisms grow very rapidly in fish at a high temperature, it should be eaten in summer not later than twenty-fours after it has been cooked.

DIPHTHERIA.

In a lengthy paper on the decrease of infectious disease consequent upon the application of preventive measures (*Boston Med. and S. Journ.*, vol. clvi. No. 8), Dr. M'Collom, Physician for Infectious Diseases, Boston City Hospital, gives some interesting facts as regards the examination of throats for diphtheria bacilli, as well as some instructive statistics as to the value of the antitoxin treatment of diphtheria. He examined the throats of 130 healthy persons, and in none of these did he find an organism giving the staining reactions of *B. diphtheriæ*, although in a few instances bacilli were found with a marked morphological resemblance to it, but differentiation was readily made by staining and cultural peculiarities. In refutation of the statement made that *B. diphtheriæ* may be frequently found in the throats of perfectly healthy persons who have the care of patients suffering from diphtheria, he states that cultures were made from the throats of 120 nurses on duty in the diphtheria wards of the South Department of the Boston City Hospital, and in no instance was the bacillus of diphtheria found.

As regards the question of release from isolation in the case of diphtheria, he is an advocate of cultural examination of the throat, two consecutive negative cultures from the throat and nose being necessary before a patient is declared free from infection. The advantage of this from an administrative point of view is important, as such cultural examination shortens rather than lengthens the period of isolation.

"Return Cases" of diphtheria at the South Department of Boston City Hospital, where this cultural examination is in operation, are of such rare occurrence "as to prove the very great importance of cultures for discharge, as in no other way can it be definitely shown that the individual is free from infection." Cultures should be commenced ten days or a fortnight after disappearance of the membrane and cessation of the discharge from the nose. "It is a waste of time and labour to commence taking cultures any earlier, and if the condition of the patient is satisfactory, it is unnecessary to wait any longer."

As regards the results of antitoxin treatment, the figures are very striking. Since antitoxin was used to only a very limited extent in 1894, he compares the years up to and including 1894 with those from 1895 onwards. Prior to 1895 the case mortality from diphtheria in the City Hospital was about 45 per cent., and since 1895 it has been on an average about 10 per cent., and in 1904 and 1905 considerably below that figure. Similarly, before the introduction of antitoxin, three-fourths of the cases with laryngeal diphtheria proved fatal, but since its introduction nearly three-fourths of such cases have recovered.

The average rate of mortality from diphtheria in Boston per 10,000 of the population from 1875 to 1894 was 14·61, while from 1895 to 1905 it was only 6. In the year 1894, eighteen people out of every 10,000 died from diphtheria, while in 1905 only a little over two per 10,000 died from the disease.

MEDICAL INSPECTION OF SCHOOLS.

DR. LOVETT, Boston (*ibid.*), deals with this subject in a very practical way. The Legislature passed a measure in 1906 requiring medical school inspection in every city and town in the State of Massachusetts. In New York, from March 1905 to March 1906, there were 75,000 school children medically examined, and of these 24,000 showed defective vision and 1600 defective hearing. These and other defects required medical attention in 50,900 of the 75,000 examined. He states that in Boston the expense of medical inspection is 17 dollars per 1000 inhabitants, costing Boston about 10,200 dollars a year, and it is held that the whole cost of this medical inspection has been saved to the city at the City Hospital. The functions of school inspection are—(1) Early detection of infectious disease; (2) detection and cure of or provision for defective children; and (3) improvement of school conditions The first two of these functions are recognised, and where school inspection exists an earnest attempt is made to discharge them. The third, he holds, is not given the prominence which it deserves. "The school furniture in general use is, as a rule, badly conceived, adapted with little or no care to the individual child, and calculated to induce improper attitudes and to favour lateral curvature."

As an example of the problems to be met, he cites the following, suggested by Dr. Harrington of Lowell: "Children grow not at a uniform rate, but by fluctuation. The greatest increase in weight occurs in the winter, the greatest growth in height from March to August." He suggests, therefore, that the school examinations should be in January, "when height and weight are balanced, and the child is in his best condition." He points out further that the question of school inspection refers not *entirely* to the public schools, for in these "on the whole the hygienic conditions are quite as good, if not better, than they are in private schools conducted in dwelling-houses, badly lighted, badly ventilated, and in no way adequate to their purpose, or properly equipped." In conclusion, he expresses the hope that communities "may be led to see that school conditions, and the health of their children, are as important to them as proper plumbing in their homes, or the protection of their drinking water."

REPORTS OF THE MEDICAL SOCIETIES.

Glasgow Medico-Chirurgical Society.—*April* 5, 1907.—Dr. J. Walker Downie in the chair.—Dr. A. A. Gray showed the temporal bones of a patient who had suffered from serous catarrh of the middle ear. The serous effusion filled the whole tympanum and attic, and extended into the mastoid cells. The patient died from other causes. — Dr. Arch. Young read for Dr. George T. Beatson, C.B., short notes on a case of so-called "traumatic asphyxia." The patient was crushed by a pit cage descending on him while he was in the erect posture, and he was kept in a doubled-up position for about three minutes. The whole face was markedly livid, with protrusion of the eyeballs and hæmorrhage into the eyelids and under the conjunctivæ. There was also a hæmatoma under the tongue, which limited the movements of that organ. The discoloration in front extended down to about the level of the clavicles, and behind was delimited fairly definitely by the outline of the trapezii muscles. With the exception of the sites mentioned where definite hæmorrhage had taken place, the colour on fading did not go through the usual changes met with in an ecchymosis, and the view was expressed that the condition might be more justly described as a stasis than an ecchymosis. The patient made an uninterrupted recovery.—Dr. H. Wright Thomson showed cases illustrating the application of skin grafting (whole skin method) in the treatment of (*a*) ectropion, (*b*) symblepharon, and (*c*) rodent ulcer; and Dr. Arch. Young gave a lantern demonstration, and showed photographs illustrating the use of a modification of the Wolfe-Krause method. The method detailed was briefly as follows. The graft was cut from the thigh or other appropriate site down to the fascial plane, and was placed in warm saline solution, the wound thus made being closed at once. The surface to be grafted was then prepared, and the graft, taken on the palm of the hand, skin surface downwards, and the subcutaneous fat cut away with scissors curved on the flat, was cut into suitable sizes, and placed on the prepared surface. The whole was then covered with "protective gauze," and a wet dressing, of sterile gauze covered with guttapercha tissue and the usual wool and bandage, applied. All down to but not including the protective gauze was changed daily, the latter being changed after a few days. The method gave uniformly good results, the grafts all taking as a rule, without desquamation or sloughing of even the superficial layers.

Glasgow Medico-Chirurgical Society.—*April* 19, 1907.—Dr. J. Lindsay Steven in the chair.—Mr. H. Rutherford described—(*a*) A case of cerebellar abscess following otitis media. The patient had had discharge from the ear for seven years, and came under observation with a discharging sinus over the mastoid, weakness in the legs, and dizziness. The symptoms entirely cleared up under free drainage, and while trying to improve his general health before performing the radical mastoid operation, cerebral symptoms developed, and he died suddenly with cessation of respiratory function. After death a small abscess was found in the lateral lobe of the cerebellum pressing on the fourth ventricle. (*b*) A case of fat embolism of the brain resulting from simple fracture of the leg. The fracture was due to a crush, and there was no evidence of any concussion of the brain at time of accident. In a day or two his speech became affected, he gradually became comatose, and died on the fifth day. After death the skull was found intact, and there was nothing abnormal on the surface of the brain. On cutting the brain, however, there were innumerable minute puncta vasculosa. On examining these microscopically, it was found that the finer vessels were injected with fat, and round each there was a minute extravasation of blood. Only œdema was observed in the lungs, which unfortunately were not examined microscopically. (*c*) Showed a case which had been operated on for sinus thrombosis following otitis media, in which ocular symptoms developed.—Dr. H. WRIGHT THOMSON described the lesion in the eyes as a bilateral retrobulbar neuritis. Dimness of vision set in two days after operation, and was almost complete in one eye at the end of a fortnight. After a temporary improvement, one eye is now blind, and the other has a visual acuteness of $\frac{6}{18}$, not improved by glasses. The vessels in the fundus are of good size, while the discs are pale, with irregular edges. The patient had had influenza before other symptoms developed, and this might have been a factor in the etiology.—Dr. J. STODDART BARR showed—(*a*) A patient from whose nose a piece of rubber was removed which had been present for over forty years. The chief symptom was violent headache of many years' duration, and had frequently caused him to cease work. The appearance of pus was made out by posterior rhinoscopy, and was thought to be due to spheroidal or ethmoidal disease. After removal of the inferior turbinate, the mass of rubber was extracted, and since then the headache has quite disappeared. (*b*) Cases operated on for empyema of the mastoid cells, in which the resulting cavities were filled with iodoform wax, after the method of Mosetig-Moorhof. The results were very satisfactory.

FORFARSHIRE MEDICAL ASSOCIATION.—*April* 5, 1907.—Dr. GRANT, Glamis, in the chair.—Professor KYNOCH showed two patients who had been successfully delivered by Cæsarean section. The first was a primipara, æt. 31, with no outward appearance of deformity, but who nevertheless had a very flat pelvis with a conjugate estimated at $2\frac{3}{4}$ in. Labour had been in progress a few hours before she was seen. She made a good recovery. The second case was that of a typical rickety young woman, short in stature and markedly knock-kneed. She had been under observation for several weeks, and the conjugate was estimated at $2\frac{1}{2}$ in. The operation was performed after she had been some time in labour, and recovery was good. Professor Kynoch considered it best to operate after labour had been in progress a few hours, in order that the cervix might become sufficiently dilated to allow a free exit to all the lochial discharge. He sterilised both patients by ligature and division of both Fallopian tubes. He considered that advisable in all such cases. Professor Kynoch also read notes on two cases of pregnancy complicated by pelvic tumours.—Dr. T. F. DEWAR, Forfar, read a paper on

"Waterborne Enteric Fever in the Noran Valley."—Dr. M'Gillivray read a paper on "The Uses and Limitations of Argyrol in Ophthalmic Practice." He stated that from his clinical experience he considered argyrol to be the most useful of all the now numerous silver salts. It was distinguished by the high percentage of silver it contained, its easy solubility in water, its great penetrative powers, its bactericidal qualities, and, above all, its freedom from irritating properties, even in a 25 per cent. solution. It was objected to by some on account of its staining of the skin and handkerchiefs, but the skin stains could easily be removed by water, and those on linen by a solution of perchloride of mercury 1–1000 of water. He stated that ophthalmia neonatorum could be cured by instillation of 6 drops of a 25 per cent. solution every hour, with frequent washing with saline solution, in some cases in twenty-four hours. Gonorrhœal ophthalmia required the same strength of solution. In simple purulent conjunctivitis nothing was better than a 10 per cent. solution of argyrol, but in subacute or chronic cases, if the discharge of pus had ceased, it was better to use more astringent remedies, such as boric acid, zinc, or alum. In very chronic cases a 2 per cent. solution of nitrate of silver was best. For simple corneal ulcers a 10 per cent. solution with ½ per cent. of atropin gave excellent results. For follicular and phlyctenular conjunctivitis, the older remedies were better. In tear duct obstruction and simple epiphora a 10 per cent. solution injected down the duct with passage of a small probe gave excellent results. In preparing the eyes for cataract operation, a 10 or 20 per cent. solution was most useful to clear away any inflammatory condition. Many other conditions could be successfully treated with it; and he considered argyrol one of the best and most valuable remedies at present in the hands of the ophthalmic surgeon, and the freedom from pain in its use and its harmlessness were such that it could be given to all patients with perfect safety for home use.—Dr. Neave read a paper on "The Action of Digalen on the Circulation." Digalen, which was introduced by Professor Cloetta, was a colourless liquid with slight ethereal odour and bitter taste, and said to be a solution of amorphous digitoxin in water, with 25 per cent. of glycerine added. Each cubic centimetre contained 0·3 mgrm. of amorphous digitoxin. This solution was said to be more stable and more certain and uniform in its action, and less irritant than other digitalis preparations, and less liable to produce cumulative effects. In order to test the preparation, Dr. Neave made experiments on the isolated frog's heart, the blood vessels of the frog, and the blood pressure of rabbits, and compared the result obtained with those got from tincture of digitalis and crystallised digitoxin. The conclusions arrived at were—(1) That digalen had a tonic effect on the heart muscle, slowed the cardiac rhythm, and increased the force of ventricular contraction. On the frog's heart in large doses it produced powerful contractions; the heart eventually stopped firmly contracted in systole. (2) Digalen produced a local constricting effect on the blood vessels. (3) It raised the blood pressure. (4) It was less powerful than tincture of digitalis, and much less powerful than crystallised digitoxin of corresponding strength. The experiments were described in detail, and lantern slides showing various tracings of the heart and blood pressure were exhibited.

EDINBURGH MEDICAL JOURNAL.

EDITORIAL.

The State and Universities.

In reply to the toast of "Our Guests" at the dinner lately given by the British Empire League and British Science Guild to the Colonial Prime Ministers, Mr. Deakin said, "If there is anything on this earth in human action which is casual and empirical, which is go-as-you-please and happy-go-lucky, it is the British Empire."

This, we fear, is but too true, and more especially applies to the attitude adopted in the mother country to many of the problems which modern civilisation and development have brought into prominence.

One of the most pressing of these problems is the question of scientific education and the future of our universities.

In his eloquent speech Mr. Deakin made a strong appeal for the necessity of scientific education to enable us to appreciate in the first place the vast, the incalculable natural resources which are at present in our possession; and, secondly, which will enable us to utilise these instruments of material power for the benefit of our race. "That," he says, "appears to me to be the task of Empire, the task of scientific conquest of its physical—and shall we not be bold and say—ultimately of its political problems, and when the principle of a scientific system of education is really in practice, the Empire will," he avers, "be marching indeed."

This recognition of the necessity of scientific education, if the Empire is to hold its own amongst the nations of the world, is merely a reiteration in eloquent language of a truth which has often of late years been impressed upon the Government in the hope of securing adequate aid and encouragement for the universities of the country.

Sir Norman Lockyer, in his presidential address to the British

Association in 1903, pointed out that in the future our universities and other institutions of higher instruction are as much a line of national defence as our army and navy. "Other countries," he remarked, "are building universities even faster than they are building battleships, and are, in fact, considering brain power first and sea power afterwards."

As, however, we have often found in the past, our statesmen only begin to appreciate such facts long after they have been grasped by other nations. So far, we are still without any indication that the importance of scientific education has been fully grasped by the Government. The universities still have to look to private enterprise and generosity to supply them with the barest necessities for modern teaching, and only the other day we had the spectacle of one of our oldest universities appealing to the public for a quarter of a million in order to enable it to meet the demands made upon it by modern requirements.

How differently the question is viewed in the United States, the recently published "Bulletin of the Carnegie Foundation for the Advancement of Teaching" shows.

In it details are given in regard to forty State Universities, and the money which has been expended upon them by Government will indicate the importance which is attached in that country to the problem we are discussing, and, possibly also, may help to explain to many of us the reason of the enormous commercial progress of America in the markets of the world.

To take some of the universities of the West alone—Michigan, Wisconsin, Illinois, Minnesota—each of these has received considerably more than a million sterling from the State in addition to sums from private sources, and these are but four out of forty universities scarcely less handsomely provided for.

In Germany the State has for long recognised its responsibilities in regard to the question of higher education and scientific training, and annually provides over three-quarters of a million for this purpose.

And what do we do? It will not be far wrong if we estimate the amount given by Government annually at £200,000, and this includes the £100,000 recently allotted to the English universities, and the £70,000 or so which goes to Scotland, and of which only about £30,000 can really be regarded as a Government grant.

We trust that the time of the country's awakening is not far off, and that the many stirring calls to action recently delivered by the representatives of the Empire beyond the seas will bear fruit. The claims of the universities for more generous treatment by the State cannot be much longer put off, if we are to maintain the position of supremacy which our forefathers won for us, and we must not forget that the future struggle will be fought by brains rather than by muscles.

Edinburgh Death and Birth Rates

In the recently issued Report of the Medical Officer of Health for the City of Edinburgh, which contains the statistics for the year 1906, the estimated population is given as 341,240, or almost exactly twice the number of inhabitants enumerated at the Census of 1861. Thus in a period of forty-five years the population has doubled—not a very great increase when compared with the rate at which new manufacturing centres develop, but still indicating steady progress and commercial advancement.

Not less satisfactory is the contrast between the mortality then and to-day. In 1861 the deaths numbered 3946, or a death-rate of 23·15 per 1000 of the population: last year the deaths were 4868, giving a rate of 14·26, or more than a third less. What this decrease means is brought more vividly home to us if we calculate the number of persons who would have died last year in Edinburgh had the death-rate remained the same as in 1861. Instead of the 4868 who did die, the number would have been 7900, in other words owing to the reduction in the death-rate a saving of over 3000 lives took place last year.

It is a simple calculation to show that the total number of lives saved by better sanitary conditions and improved circumstances during the forty-five years in question cannot be short of 100,000.

In contrast with this highly satisfactory aspect of the mortality statistics are the figures relating to births.

During the last twenty-five years the birth-rate has shown a continuous and steady decline, each year since 1871 showing, with few exceptions, a lower rate than the one preceding it. Thus in 1871 the number of births was 6874, giving a birth-rate of 34·89, and in 1906 the births numbered 7649, equal to a rate of 22·41, the lowest figure it has ever touched. The significance of these statistics may be indicated by the same method we have adopted in regard to the deaths. If the birth-rate of 1871 had persisted, then instead of only 7649 births being recorded in 1906, we would have had 11,909, or 4260 more than were actually registered.

While the smallness of the birth-rate in Edinburgh last year is not paralleled by any cities of equal size in the country, yet the general tendency is the same in all of them, and the fact is one of great economic importance and concern for the future welfare of the kingdom.

The recently issued Annual Summary of the Registrar-General, however, shows that we are not alone in having to deal with this problem, and that a similar phenomenon is to be observed in most of the large centres of Europe. Thus in 1906 the birth-rate of Paris was 18·8, in Brussels 18·5, in Berlin 24·9, compared with a rate of 26·7 in London.

Everywhere the size of families seems to be decreasing, owing to causes which we cannot at present discuss, but which are sufficiently obvious to all interested in sociology. The universality of the fact is, however, but small consolation to us when we remember our vast inheritance of empire, and the necessity of leavening the immigration of the foreign element into our colonies by good stock from the mother country if the best traditions of the race are to be maintained.

The Late Sir Joseph Fayrer.

The death of Sir Joseph Fayrer removes one whose career was full of distinction. He entered the Navy as an Assistant-Surgeon in 1848, and in this capacity took part in the expedition under Lord Mount-Edgcumbe, and was present at the siege of Palermo. He was next appointed to the Ordnance Medical Department, and then to an Assistant-Surgeoncy in Bengal, and it was in India that the most important part of his professional life was spent. He served in the Burmese War of 1852, and in the following year was appointed to the coveted post of Surgeon to the Residency at Lucknow. He had been married and settled there less than two years when the Mutiny broke out, and Fayrer and his young wife had many perilous and tragic experiences. His house was an asylum for many families besides his own, and among those seriously wounded under his care were Lawrence, Outram, and Napier. He himself was wounded during the siege, while most of his companions perished at the hands of the rebels in the course of the year. In his "Recollections of My Life," written some years ago, he brings out in vivid language at once the horrors and the mystery of the Mutiny.

Although his health was never thoroughly restored, his subsequent career was full of achievement. On returning home in 1858, he took his degree of Doctor of Medicine at the University of Edinburgh, and became a Fellow of the Royal Colleges of Surgeons of Edinburgh and of England. For the next fifteen years he was Professor of Surgery at Calcutta, and became the leading scientist and doctor in the Presidency. He was chosen to accompany the Duke of Edinburgh on his tour through Bengal and the Upper Provinces, and some years later was specially selected by Queen Victoria to be the physician in the suite of the then Prince of Wales on his Indian tour, and was instructed to write direct to Her Majesty as to the Prince's well-being.

Fayrer was a voluminous writer, his best-known works being "Clinical Surgery in India," "The Climate and Fevers of India," and, most important of all, "The Thanatophidia of India," which since its publication has held the first rank as a monograph on the poisonous snakes of that great continent.

His achievements received abundant recognition both at home and abroad. He was given an honorary degree at the Universities of Edinburgh, St. Andrews, and Padua; he was made a foreign associate of the Academy of Medicine of France, of Lisbon, of Rome, and of Philadelphia: while by Queen Victoria he was created a Baronet.

For upwards of twenty years he was President of the Medical Board at the India Office, where his intimate knowledge and experience of Indian affairs was of invaluable service to his country.

The Society Journalist.

THE inaccuracies of the Society Journalist are not serious enough matters for protest, and their little exaggerations are not matters of grave import. But when the light-fingered and highly imaginative journalist comes to deal with more serious and potent matters, it is quite another story. A few weeks ago that sprightly barque of journalism, M.A.P., carried a heavy cargo so badly shipped that there is no surprise that it floundered hopelessly in the trough of the critical waves, for it admitted into its journalistic hold nothing less than an article wholesale condemnatory of our hospitals and hospital systems. A certain Mr. James Douglas essayed this task. We have no means of ascertaining what are Mr. Douglas's qualifications for such a libel. Our only remembrance of Mr. Douglas's name is a reference to an article which appeared in *Blackwood's Magazine* entitled "The Apotheosis of Sycophancy," in which a trenchant writer held Mr. Douglas up to scorn for an evident piece of ingenuous idolatry of the second-rate in literature. But we can readily forgive hero-worship, however "clay-footed" the hero. The sins of over-appreciation are readily pardoned; but when the same writer reveals the other side of the personal coin, we begin to suspect the character of his judgment. If we were to take Mr. Douglas seriously—and he is the last man in the world, evidently, to be guilty of a joke—we should imagine that the infirmaries and hospitals of this country are hotbeds of incompetence, negligence, cruelty, indifference to pain and suffering, quackery, and worse. From his delightful point of view the hospital is the enemy of the people. The patients look upon it as a sort of minor hell, where they are subject to the vagaries of ignorant time-servers, who use the hospital for advertisement and for vivisection. The modern infirmary is held up as a hollow mockery of pseudo-philanthropy, where the chief surgeons and physicians rarely attend, and their flying visits of five minutes a day he regards as prostitutions of consultation and the merest claptrap of scientific investigation. All this is pretty pleading, and is not without its comic side, but we have said that Mr. Douglas has no parley with the sense of humour, so we may be allowed to view it on a more serious level, and describe the whole charge as a malicious libel subservient of truth and decency, the apotheosis of slander run riot. The difficulty of dealing with such a charge is that it is made in a comparatively irresponsible journal, which is not open to a reply, and the chief danger lies in the fact that the said journal has an enormous circulation amongst that very class of people who may be dependant upon hospitals, and are only too willing to believe anything that is honoured by type. The spoken lie may be decimated by the retort courteous or otherwise, but the printed libel comes to roost. If this be the case, Mr. Douglas has laid upon his shoulders a burden which we hope he may find grievous to bear. For such a man there can be no pity, only disdain. He brings discredit not only upon himself, but upon the members of the third estate who take him to their bosom. We have only one thing to say to him. Let him use his inky fingers on those pleasantries for which he has been trained, but let him leave alone the sacred places of the earth. His attempt is nothing less than one to undermine confidence in a system which places at the service of the poor the very highest medical knowledge of the day, and a system which is the central star in the crown of modern philanthropy. Guineas are easily made in modern journalism, but that they should be made at the expense of the unselfish work of others is a scandal. There is one great danger in being put on a pedestal. The majority may worship, but there are always the scavenging few who will throw mud. We hope, however, there are sufficient moral policemen to keep their eyes on such mudlarks, and after Mr. Douglas's article we have no hesitation in putting him on the list.

ORIGINAL COMMUNICATIONS.

THE THERAPEUTIC VALUE OF FORMIC ACID IN THE TREATMENT OF DIPHTHERIA.

By Claude B. Ker, M.D., F.R.C.P.Ed., and David H. Croom, B.A. (Cantab.), M.D. (Edin.).

For some years after the introduction of antitoxin the percentage case mortality rate of diphtheria gradually declined, as the doses of serum administered became larger. Latterly, however, the death-rate has tended to remain more or less stationary, no doubt because we have reached the limit beyond which no improvement can be expected by increasing the dosage of serum. The mortality from the disease is still serious enough to make it necessary for us to do all in our power to supplement the action of the serum by the use of some suitable treatment, and indeed there are few who are accustomed to rely solely upon the use of antitoxin. Stimulation by alcohol, the systematic use of iron, of strychnine, or of various cardiac tonics, have all their supporters, and the value of some general tonic treatment may be said to be universally admitted. In this paper we propose to give our experience of a drug which has hitherto been but little employed in medicine, and never, to our knowledge, in the treatment of diphtheria.

Formic acid, as is well known, occurs in nature in the bodies of ants, in the hairs and other parts of certain caterpillars, and in stinging nettles. Its stimulant properties have been known for centuries. The Arabs were accustomed, before commencing any particularly long and arduous journey, to administer a decoction of ants' eggs to their horses, believing that their powers of endurance were thereby markedly increased. Preparations containing formic acid have also been long used as remedies, being greatly esteemed for their supposed tonic, diuretic, and aphrodisiac properties. Huchard has pointed out that there are, in the pharmacopœias of the seventeenth and eighteenth centuries, references pointing to the value of such preparations in dropsy, chronic skin eruptions, and paralysis, and adds that formic acid itself has remained officinal in Switzerland and Germany. Garrigue, in 1902, claimed that the drug was useful in infectious and chronic diseases, and even had hopes of influencing favourably the course of tuberculosis and cancer by its administration.

It was not, however, till 1903 that Clément made a really scientific investigation of the properties of the acid, and reported the results of his experiments in a communication read before the Société Nationale de Médicine de Lyon. He found that formic acid is a powerful stimulant of striped muscle, and is in its tonic action closely allied to kola, cocoa, and caffeine. The internal administration of the substance is very efficacious in dispelling sensations of fatigue and in increasing muscular power as estimated by the ergograph and dynamometer. In the same year Krull noted marked improvement in chronic kidney conditions with albuminuria after the subcutaneous injection of formic acid, in solution from 1–1000 to 1–100,000, according to the age of the patient. Provided no advanced cardiac disease existed, he found that nutrition was improved, albuminuria diminished, and diuresis increased. In 1904, Clément reported further experiments corroborating his previous statements regarding the increase of muscular force after the administration of the drug, and he also obtained good results in the treatment of two cases of muscular tremor.

The results of Clément were confirmed in almost every particular by Huchard in 1905. This observer, however, appears to have worked chiefly with formate of soda. He came to the conclusion that there is no doubt about the action of the drug in increasing muscular force, and suggests that the presence of formic acid in the bodies of ants may have much to do with their remarkable strength. There is equally no doubt about the diuretic properties of this substance, which, moreover, has practically no toxic qualities. Huchard has used it in neurasthenia, post-influenzal conditions, infectious diseases, dilatation of the heart, and senile weakness, and appears satisfied with the results obtained. But later in the same year he found it necessary to protest against the use of this remedy as a sort of universal panacea, and advised that its employment should be restricted to those cases in which there is an indication for tonic and diuretic treatment.

Considering that the asthenia, so characteristic of diphtheria, might be favourably influenced by the use of formic acid, one of us (Croom) treated with this substance one hundred cases of that disease admitted to the Edinburgh City Hospital in the early months of 1906. His results, published in the October number of this Journal, were sufficiently encouraging to warrant a more prolonged trial. Accordingly, during the remainder of the year, all cases of diphtheria admitted to the hospital were systematically treated with formic acid.

In undertaking this method of treatment, our main object was to note its effect on the occurrence of heart failure and of post-diphtheritic paralysis. It was considered that a substance, reputed to have such a marked tonic effect on muscle, might to some extent act as a prophylactic to that most dreaded of all the sequelæ of diphtheria, cardiac failure. Moreover, it should in some degree prevent those forms of paralysis in which the muscle rather than the nerve plays the most prominent part, as, it has been suggested, is the case in palatal paralysis. Further, it was hoped that the patients would benefit by the improvement in nutrition, which is so much insisted on by the French observers. Lastly, it was not unreasonable to suppose that albuminuria might not occur so frequently in cases treated by a drug, which, in contrast to adrenalin and strychnine, has no marked action in increasing the blood pressure.

It is exceedingly difficult to estimate the value of any particular drug in the treatment of diphtheria. Some cases react so much better than others to serum treatment, and afford examples sometimes of such astounding recoveries, that it is impossible to attribute a quite unexpected change for the better in a desperate case to any new remedy which may be undergoing trial. Two cases, similar apparently in all respects, may be admitted; both may appear quite hopeless, and both receive equal doses of serum. Yet, while one improves from the first, the other may as steadily progress to a fatal termination. If the former has been treated with any new remedy, it would none the less be entirely unsafe to attribute its recovery to that cause. Differences of immunity and resistance, differences in the association of the infecting micro-organisms, may be, and probably are, quite sufficient to account for that result. It seems to us safer to rely on broad results than to depend too much on the impressions which have been left by individual cases.

Here again we are confronted by the difficulty that we are compelled to take as our standard of comparison the statistics of the hospital in previous years, and the question at once arises whether diphtheria was more or less severe in type last year than it has been previously. This we can only judge from our personal impressions and from the average amount of antitoxin given to each patient in each year. The type of diphtheria in Edinburgh has recently been mild. For four years preceding the one under discussion there has been practically no change in the mortality rate, which has remained between 7 and 8 per cent. In 1905 it was exactly 8 per cent. During the year 1906 there was no obvious change of type, and the average amount of antitoxin given was the same. We have no reason to believe that the disease was in any way less severe.

The routine treatment of diphtheria at the hospital in previous years has been the systematic administration of small doses of strychnine to all cases. This, we are aware, raises another difficulty, as although strychnine is approved of by many outstanding authorities, other competent physicians object to its employment. Whether they would carry their objections so far as to suggest that the mere withdrawal of strychnine from the routine treatment would account for any improvement subsequently noted, we are not prepared to say. One of us, however, has been gradually led to adopt this systematic use of strychnine after long experience of cases treated by various methods, and is convinced that it has hitherto given by far the most satisfactory results.

The formic acid which during 1906 was given systematically to all patients instead of strychnine was administered in the form of a 25 per cent. aqueous solution. Of this, doses varying from 5 to 20 minims were given in water every four hours. The dosage was graduated more by the severity of the case than by the age of the patient. As a rule, no immediate effect on the pulse was noted. Our experience was the same as that of the French writers, that forty-eight hours' administration is necessary before any change is observed. This change would appear to be rather a negative than a positive one, that is to say, that a large proportion of the severe cases did not show the irregularity and weakening of the pulse which would be naturally expected as the disease progresses, although it is only fair to say that in many instances the character of the pulse was much improved. Broadly speaking, less irregularity of strength and rhythm was observed than is usual. The general nutrition of the patients appeared benefited, and the most striking feature of the cases was the way in which their colour improved. Even in patients suffering from the most profound toxæmia, who were admitted pale, with lips almost purple, a natural and healthy colour rapidly returned to the lips and cheeks, and, most curious fact of all, this colour seemed to be maintained to the last even when a fatal termination ensued. This was especially commented on by nurses with large experience of diphtheria. The drug was easily taken, and caused no tendency to sickness. Indeed, it could be given with no bad effects to patients, who could tolerate nothing else by the mouth except iced brandy. The diuretic effect we found to be disappointing, and we are not inclined to lay stress on this property of the acid. In this respect, then, we cannot confirm the observations of Clément and Huchard.

As regards the broad statistical results, we have made a comparison between the two years 1905 and 1906 in the subjoined table, omitting from the latter year fifty cases which were not treated with formic acid and of which the percentage mortality was 8, the paralysis rate being 6 per cent.:—

Year.	No. of Cases.	Percentage Deaths.	Percentage Fatal Heart Failures.	Percentage Paralysis.	Percentage Albuminuria.
1905	507	8·0	3·07	9·09	23·7
1906	412	6·2	1·94	2·9	15·7

If the forty-eight hour death-rate is deducted, there is not much difference in the results. In 1905 the rate is 6·8, in 1906 4·6 per cent. A somewhat larger percentage of cases, then, was admitted in a hopeless condition in 1906 than in the previous year.

It is usual, in estimating the great advantages of the antitoxin treatment, to lay stress on the laryngeal and operative death-rates, as these refer to a class of cases more fixed, so to speak, in type. The general improvement noted above is confirmed in an interesting manner by our figures. The death-rate of all laryngeal cases in 1905 was 18 per cent. In 1906 it had fallen to 16 per cent. Of the cases subjected to tracheotomy or intubation, the mortality in 1905 was 35·28 per cent. In the following year only 25·7 per cent. died, although a smaller percentage of the total laryngeal cases were operated upon.

We are well aware that a fall of little under 2 per cent. in the mortality rate cannot be claimed as a striking success, and may be readily explained by other causes than the addition of formic acid to the routine treatment. Still, looked at from another point of view, it is a reduction of the existing rate by, roughly speaking, a quarter. It is, moreover, interesting that no fluctuation in the rate has been observed in Edinburgh for the last four years, and it is most curious that its first marked variation should coincide with a complete change of treatment.

As regards the heart failures, we only include the cases which suffered from such classical symptoms as cardiac vomiting, pain, and syncope. The reduction of the fatality from this cause is very slight, and, we must confess, is disappointing. Still, we have observed patients who suffered from all these symptoms, and who appeared certainly doomed, rally in a way which has not previously been noticed in our wards, and we attribute the fall in the death-rate from this cause, small as it is, to the four or five patients who survived these attacks. We think it possible that the use of formic acid either limited the degeneration of the cardiac muscle, or acted beneficially upon its undamaged fibres. It is also possible that, as we had hoped before commencing this treatment, the blood pressure not being raised, the work of the heart was rendered easier.

The most interesting and surprising of our results is the extraordinary decrease in the amount of paralysis. This rate has varied more in recent years than the death-rate. In 1902 and 1903 it was 17 per cent., in 1904 somewhat over 12 per cent., while it fell to 9·09 in 1905. But in 1906 it was only 2·9 per cent., and throughout the year it was difficult to find cases to demonstrate this complication to the students attending the hospital. The small amount of it cannot be possibly attributed to slight cases being missed. If, on the other hand, we assume that the diminution of paralysis is really due to treatment with formic acid, the interesting point is raised why a muscular tonic should have such a surprising result on a lesion usually regarded as primarily of nervous origin. It is true that the post-diphtheritic muscular weakness is more a paresis than a complete paralysis.

It appears that only certain of the nerve fibres are affected in the degenerative process of the peripheral nerves. Are we to suppose that those muscular fibres, whose nerve supply is unimpaired, are so stimulated by the formic acid as to be able to carry on the work previously performed by the whole muscle? Or is it possible that the general improvement in nutrition so affects the nerves that the tendency to degeneration of their fibres is lessened? Or may we not assume that the muscle is primarily affected in some forms of paralysis, as is admitted to be the case with the cardiac muscle, and, as Rolleston has suggested, probably with the palatal muscle also?

As regards albuminuria, the observations of others had led us to believe that this complication might also occur less frequently. It is, however, extremely difficult to explain satisfactorily why this should be, and we will content ourselves by stating the fact that its percentage incidence was very materially reduced.

The most obvious criticism of these results is to assume that the type of diphtheria was milder in 1906, and that this is particularly evidenced by the small amount of albuminuria and paralysis. We have already pointed out that, judging by the average amount of serum administered, the cases appeared as severe as those of the previous twelve months. The antitoxin dosage has always been determined by the same individual acting on more or less fixed principles, and for economical reasons the dose given is very seldom more than is absolutely necessary. The greatest care has been taken to exclude from these statistics all cases which could not fairly be called "clinical" diphtheria. Of 585 admissions to the wards, 123 have not been included. Many of these had the bacillus of diphtheria present in their throats either before, or at the moment of, admission. The mild type of diphtheria which has recently been present in Edinburgh makes the estimation of differences in death and complication rates very difficult. When a death-rate is only 8 per cent., and one-quarter even of these deaths occur within forty-eight hours of admission, there is not much room for any striking improvement in the percentage mortality.

Our only conclusion is that the results obtained are distinctly encouraging, particularly in relation to the occurrence of cardiac failure and paralysis. Formic acid is at least an admirable tonic, and we think it may be used in the treatment of diphtheria with safety, and to the great advantage of the patient. We are continuing our observations, and we trust that, by giving the drug to every alternate case only which enters our wards, we may secure a safer standard of comparison for its merits, and so avoid the fallacy raised by a possible change of type in the severity of the disease.

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TRAUMATIC RUPTURE OF THE INTESTINE.[1]

By William Henry Battle, F.R.C.S., *Surgeon to St. Thomas's Hospital, London.*

In the consideration of the nature of the injury which has resulted from an accident to the abdomen without external wound, the surgeon is much better placed than he was a quarter of a century ago. Much more is known of the value of the symptoms which follow a contusion of the abdomen, and the line of treatment to be followed is not only clearly understood, but gives a fair chance of recovery. The older method was to administer opium, either by the mouth or subcutaneously, and "wait for symptoms"; the more modern plan, founded on our greater knowledge, to operate as soon as possible, and repair the damage which has been caused. This period was practically inaugurated at St. Thomas's Hospital, by the late Mr. John Croft, when he performed his first abdominal section for contusion of the abdomen with rupture of the small intestine in 1887. Many operations for this condition have been performed since that day memorable in the history of the hospital, and many lives have been saved as a result of the encouragement given to others by the success which he then obtained.

We have recently been considering "the acute abdomen," and the treatment of perforations of the digestive tract, and the last accident week has furnished us with an example of secondary rupture of the small intestine due to traumatism, which in every respect resembles a perforation of the bowel the result of disease. To-day I wish to make a few remarks on intra-peritoneal rupture of the bowel due to violence, for there are yet differing opinions regarding the symptoms on which reliance should be placed if a correct estimate of the gravity of any case is to be formed. There is no difference of opinion amongst hospital surgeons as to the treatment, but there is still too much delay in applying it, if we can trust records of cases which occasionally appear. When peritonitis is present, nobody has a difficulty in making a diagnosis, but it is often too late then. The diagnosis should be made and acted upon before inflammation has produced its characteristic signs.

The case above referred to is as follows:—

Case 1.—On the 8th of October 1906, a boy, æt. 14, was admitted to City Ward at 7 p.m. with a history of injury to the abdomen. At 3 p.m. he was walking along a row of iron posts, and when stepping from one post to another his foot slipped and he fell, striking his abdomen on the post in front. He fainted, was taken home, where he was sick several times, and complained of great tenderness in the abdomen. He could not pass his water. When brought to the hospital he was still suffering from shock, and complained of pain in the lower part of the abdomen. This on examination was found to move fairly well, was not markedly rigid, though some rigidity was present about the lower part of the left rectus. There was tenderness around and below the umbilicus, but this appeared to be rather superficial. There was no area of dulness in front and no shifting dulness in the flanks. The liver dulness extended from the sixth to the ninth rib. A considerable quantity of clear urine was drawn off. Pulse 100, of small volume; temperature 99°.

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[1] A clinical lecture, delivered on October 18, 1906.

It was stated that for two or three days before the accident the boy had had a cough and sweating at night, and had talked of going to the hospital for medicine.

October 5.—He was sick at 9.30 last evening, but since then has not vomited. During the night the temperature went up to 103°, and the pulse rose to 120. This morning the temperature is 101°, pulse 110, and the patient seems very comfortable. Urine normal. There is no diminution of liver dulness, and no increase of rigidity of the abdomen. He says that he has no pain unless the abdomen is touched. At 3 P.M., when most of you saw him with me, he had quite recovered from the shock, and presented the aspect of one suffering from reaction. He was flushed, with red lips, bright eyes, and dilated pupils; the pulse was 110, and he was dozing comfortably, lying on his back. The thighs were not flexed on the abdomen, but were placed straight. His temperature, which had been 103° during the night, had fallen to 100°. The pulse was not wiry, he was not restless, and the vomiting had ceased. On examination of the abdomen there was no abrasion or mark to be seen. It was normally distented without any peristalsis being visible in the gut. He could draw a deep breath without pain. On palpation there was no rigidity of the muscles, but he complained of a general tenderness, not excessive. The percussion note was normal throughout, the liver dulness being satisfactory; it was thought that the note was less clear in the flanks, but this was put down to the greater thickness of the muscle there, for it did not alter with position. The opinion given then was that we had no evidence of complete rupture of the gut, but that it was quite possible it was severely contused, and that it might give at a later period, when immediate operation would be required. This opinion was founded on the account of the case up to 3 P.M., not on the local condition. About 5 P.M., when I left the hospital, he again complained of sharp pain in the abdomen, and the pulse rate increased to 136. At 7 P.M. the abdomen was rather more rigid, and there was some diminution of liver dulness. At 9.30 P.M. he vomited a considerable quantity of greenish fluid, and the abdomen was slightly more rigid, especially about the upper part of the left rectus. The pulse was 120; the liver dulness was less evident, but there was no dulness in the flanks.

Median section was performed at 12 o'clock by the resident assistant-surgeon, who found evidence of recent peritonitis, with some free fluid in the pelvis, which had run down the descending colon. In several places the small intestine was distended and showed signs of bruising, with small hæmorrhages into the mesentery. Near the upper end, where the flakes of lymph were most abundant, a small recent perforation was found. This was sutured with two rows of Lembert's sutures. The abdominal cavity was freely washed out with warm saline solution, and the wound closed. He improved for a time, but on the 7th he was restless and vomited considerably during the afternoon, whilst later the abdomen was rather distended.

He died at 5.30 on the 8th, the pulse having become very rapid and weak, after a restless night.

The perforation was situated 57 in. from the commencement of the intestine. The sutures, of which a double layer had been inserted, had held perfectly, and the post-mortem examination only showed localised peritonitis, which had probably commenced before operation. It was probable from the post-mortem examination and the history that the bowel gave way secondarily at about 5 o'clock on the day following the injury, and that the peritonitis dated from that time.

None of the symptoms on which we rely as aids to the diagnosis of intestinal rupture were present, and the blow was not quite sufficiently severe to make exploration a desirable thing in their absence. In some cases of abdominal injury it is advisable to operate as soon as possible, on account of the nature of the force inflicting the damage. If there are symptoms to cause uneasiness after a kick in the abdomen from a horse, donkey, mule, etc., the best plan is to operate as soon as possible. In this I agree fully with Mr. Bernard Pitts. Surgical literature is full of examples of fatal cases resulting from this cause, especially amongst stablemen and grooms. Of course all patients with abdominal injury must be most carefully watched, and no one could have paid greater attention to any patient than did the house-surgeon, Mr. Howarth, who looked at this boy every hour during the night after admission. The patient must not only be carefully watched for the onset of new symptoms, but in cases where the diagnosis has been made and operation decided on, he must be visited frequently, so that a favourable time may be seized for operation on recovery from the shock.

I have elsewhere suggested that cases of abdominal injury should be as carefully examined (and a record made of the symptoms found) as any case of acute abdominal disease. The same methods of examination are available and required, and the line of treatment is similar.

You must ascertain the history of the patient, and find out if his health was good up to the time of the accident, the exact time and the manner in which the accident occurred, the part of the body which was struck, and the immediate effect of the injury. Did the injury occur soon after a meal, or when there was reason to suspect a full bladder? Note the general condition of the man, his pulse, temperature, condition of pupils, vomiting, etc. Find out the position and character of the pain. Examine the abdomen:

is it retracted or distended? are there any marks on the skin? is it moving normally, or is it only moving in the upper part? Can the patient take a full breath, and does the attempt increase the pain? Is it tender? if so, is this tenderness localised or diffused? What is the condition of the abdominal muscles, are they generally rigid, or is rigidity limited to one rectus or one part of the wall? What is the result of percussion, as regards normal or abnormal dulness? Is there hyper-resonance? Has urine been passed, did it contain blood, or has blood been seen in the vomit, or in any evacuation from the bowel?

In all cases a catheter should be passed as an indispensable part of the examination, unless the patient voids urine in normal amount before the surgeon. By the aid of the catheter you ascertain if the bladder has been ruptured or if the kidney has been injured, but to-day we must suppose that the result of this investigation is satisfactory, and the urinary system has escaped damage. What are the local signs on which we can rely as indicating intra-peritoneal rupture of the small intestine?

Those of you who attended the clinical lectures which I gave last session on "The Acute Abdomen"[1] will recognise a remarkable similarity between the symptoms described in cases of that nature, and those resulting from a solution of continuity of the intestine the result of injury, with the escape of intestinal contents into the peritoneal cavity. There is even a closer resemblance to the class of case then put before you, in the secondary giving way of a contused area in the intestinal wall, or the ulceration of a stitch after an attempt to repair a laceration has been made.

The immediate effects in both are shown by "peritonism"—local pain, shock, and vomiting—and there is no definite rule regarding them, so much depends on the individual, the nature of the force, and the part of the abdomen on which it acts. There is mostly some shock in every contusion of this region, but its severity is no guide to the damage within that has been inflicted by the injury. A blow, especially in the upper abdomen over the region of the large solar plexus, may send a strong man down gasping and in an alarming state of collapse, from which recovery may be rapid; whilst an injury by which the intestine has been ruptured may not be accompanied by sufficient shock to make the patient or his friends anxious.

Vomiting is very commonly present as an early symptom, and should be regarded as very important if it persists or returns after an interval of quiet. When the stomach has been ruptured, the vomited material will contain blood, otherwise the vomit only consists of the remains of the last meal or of bile-stained fluid.

Local pain may not be a cause of complaint, on the other hand it may be excruciating, so that the man shouts out with agony at each attempt to fill his lungs, and only draws in breath when actually compelled to do so by impending suffocation.

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[1] *Lancet*, London, 1906, vol. ii.

There is another symptom which may possess more importance than it has hitherto received, and that is a marked rise of temperature within a short time of the injury. It has been noted in many records where there was a rupture of the intestine, and it was present in the case on which these remarks are founded, before the actual giving way of the wall of the bowel: here 103° was registered within a few hours of the accident, although the reason for such a temperature was not apparent, the local signs of serious injury to the gut being very indefinite. Still in future I should regard it as a symptom of considerable moment, indicating a serious lesion of the intestinal wall demanding at the least an exploratory incision.

As regards the value of local symptoms, it will perhaps give you a better idea of things as they present themselves, if I give a short abstract of the careful notes of some cases which have been under care formerly at this hospital, in which operation was performed.

Observe especially the frequency with which muscular rigidity was found—the most classical group of symptoms being severe local pain, vomiting, shock, and fixity of the abdominal wall, followed by a rise of temperature and rapid pulse. In some the signs of peritonism pass away as they came, like a thunderstorm, and a calm follows before the onset of the peritonitis, which is often insidious in its advance (like a following flood), but unvarying in its deadliness, unless arrested by mechanical measures. In these cases the life of the patient depends on the recognition of early and slight signs, for there is no sudden pain to call the inexperienced to a knowledge of the hidden danger and to mark its commencement.

CASE 2.—A stableman,[1] æt. 24, was admitted on 10th August 1892, suffering from the results of a kick in the abdomen by a horse, about half an hour earlier. He was received in a very collapsed state. He had not vomited. He was a spare man of slight build, suffering markedly from shock, with anxious white face, a small and feeble pulse. He complained much of pain in the abdomen. Below the umbilicus, extending more to the left than to the right of the middle line, was a bruise not particularly defined, but in the situation where the hoof of the horse had struck him. The abdomen was extremely hard to the touch, somewhat distended, and motionless. There was dulness on percussion over the front of the abdomen. Clear urine was drawn off by catheter. Soon after admission he commenced to vomit. At 3 P.M., when I first saw him, he was still suffering from shock, being cold and shivering, with an anxious face; he was lying on his right side, with limbs flexed. The abdomen was fixed, like a board, very hard and very tender. The dulness over the front of the abdomen was larger, but did not extend into the flanks or into the epigastric region.

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[1] See *Trans. Med. Soc. London*, 1892.

Intra-peritoneal rupture of the intestine with rupture of the mesentery or omentum, with extravasation of blood, was diagnosed, and at 8 P.M., when operation was performed, on sufficient recovery from shock, this diagnosis was fully confirmed. The mesentery was bruised and lacerated, and hæmorrhage was still going on from it. There was rupture of the small intestine in two places within a distance of 8 in., the gut having been divided as cleanly as with a knife. Only a small amount of intestinal contents had escaped, amongst which were one or two partly digested beans. The intestine was contused, and in one or two places the peritoneal surface was torn. Thirteen inches of the bowel, including the damaged mesentery, were removed, the section being made beyond the ruptures where the bowel was apparently healthy. Union was effected by lateral apposition, and the mesentery was sutured. Another rupture involving almost the entire circumference of the gut was then discovered about 12 in. away; this did not appear bruised, and the union was made end to end with Senn's plates, without resection. Saline infusion to the extent of 5 pints was given into the median basilic vein for the relief of shock. Progress was satisfactory until 6.45 on the evening of the 15th, when vomiting returned with severe abdominal pain and local signs of peritonitis. The wound was opened up, and the end-to-end union having been found to have broken down, an artificial anus was formed, his condition not permitting of any more prolonged treatment. He died on the following morning. At the necropsy it was found that the first rupture had occurred 20 in. from the pylorus. Hæmorrhage had been extensive in the left lung.

Here the history of the injury, the kick of a horse, was very definite; the symptoms commenced immediately afterwards, with intense pain, rather of a paroxysmal character, accompanied by vomiting, well-marked shock, and intense anxiety of mind. The hardness of the abdomen was indeed remarkable; the walls appeared immovably fixed, and respiration was entirely thoracic. The only local evidence of the kick was the slight bruising alluded to, and this would have been overlooked without careful search. The slightness of the discoloration following such an injury has been frequently noted in similar cases, and it is important from a medico-legal point of view. I have known a man who had kicked another in the abdomen with fatal effect acquitted by one of our sapient juries, because "*it*" in its collective wisdom did not think that so severe an injury could have been caused without some external sign of the damage inflicted on the bowel.

It was considered in this case that the dulness on percusion indicated rupture of the mesentery or omentum, and that it was caused by effusion of blood beneath the abdominal wall. The amount of extravasation of the contents of the bowel was not of itself sufficient to produce dulness, nor do I think that it ever is in these cases. Its position in front was against its origin from any of the solid viscera. Continued extension of this dulness may necessitate exploration, as there may be severe injury of the mesentery and hæmorrhage. Mr. Bernard Pitts thinks that this dulness over the seat of injury may be caused by collapsed intestine as a result of temporary paralysis.

All cases will not present the same symptoms; many differ from this type. In 1885 I showed a specimen of extensive laceration of the small intestine at the Pathological Society, which had been removed from the body of a man, æt. 21, who had died from peritonitis following a kick from a horse. The injury was inflicted at 5 P.M. the day before admission; he seemed unable to move for about a quarter of an hour, but then went on with his work till 6.30 P.M. On returning home he had food, but vomited it almost immediately, and was restless during the night. However, he went to work in the morning at 6 o'clock. After a slight breakfast he was unable to resume work on account of pain in the abdomen and vomiting, and went home to bed, whence he was brought to hospital at 1.30 P.M. in a state of extreme collapse, from which he did not rally. He died from peritonitis twenty-seven and a half hours after the receipt of the injury. The opening in the small intestine measured 1½ in., and there was contusion and laceration of the bowel wall round it. Such cases are luckily not common, and it is hardly credible that a man could do manual work, thirteen hours after such an injury.

In cases of less extensive rupture the peritonitis may come on more gradually, as in the case of a man, æt. 48, who came under my care at the Royal Free Hospital with a distended abdomen and an advanced stage of septic inflammation, which had followed a contusion of the lower part of the abdomen caused by running against an iron post four days earlier. The rupture was a small one, but the peritonitis was extensive, and operation gave little relief. He had persistently refused to see a surgeon until all chance had passed away.

In another instance all signs of ruptured gut were obscured by another condition. A man, æt. 60, was admitted to St. Thomas's Hospital, having been run over in the street on Derby night. He was suffering from shock, and had pain in the right lower abdomen, with an irreducible inguinal hernia on that side; he also vomited. He appeared to improve after operation and reduction of the hernia, but died from peritonitis due to an unsuspected rupture of the small intestine on the fifth day. This was situated 6½ ft. from the ileo-cæcal valve, and measured about 1½ in. in length. There was nothing abnormal about the sac contents.

A remarkable case, in all probability of a similar nature, is recorded where a patient was submitted to operation for peritonitis due to injury. A hernial sac which was explored was found to contain a piece of potato. The opening through which this had escaped must have been of large size, although it was not found, yet the patient recovered.

The only chance of recovery is afforded by early operation, and I am strongly of opinion that it should mean suture of the bowel after resection of the contused edges, not the formation of an artificial anus. There are several reasons for this—(1) The rupture is generally found high up in the jejunum,[1] most frequently in the first 3 ft.—a bad position for an artificial anus, from the difficulty met with in feeding the patient. (2) The rapidity with which the union can be effected. (3) The risks of a later operation for closure of the opening in a patient whose general condition is bad.

Mr. Croft's patients had the following symptoms:—

Case 3.—No. 1,[2] æt. 34, after being jumped upon seventeen hours before, was admitted, with a temperature of 103°, and symptoms which were thought to indicate peritonitis. A transverse rupture of small intestine to the extent of two-thirds of its circumference, with laceration of mesentery and omentum, was found on operation eighteen and a half hours after injury. Septic peritonitis had spread to a considerable distance. Artificial anus was formed at the time, and resection of intestine with end-to-end anastomosis four weeks later; death ensued from shock.

Case 4.—No. 2,[3] boy, æt. 14. Kicked by a horse at 7.30 p.m., 21st May 1889; admitted to hospital 10.30. Fainted after the blow, and had vomiting and pain before admission. No shock on admission. The lower part of abdomen was tender. Temperature 99°·2, pulse 80. During the night the temperature rose to 103°·6. On the following morning his condition was worse—his expression was anxious, lips dry, pulse quick, temperature 103°. Abdominal wall flat, rigid, and very tender. The muscular resistance was very marked. Slight dulness in the left loin. There had been no vomiting since his admission. Mr. Croft performed laparotomy about fifteen and a half hours after injury; separating adhesions, removing septic fluid, and resecting the gut, the opening in which measured ⅝ in. in diameter. End-to-end anastomosis was performed. Complete recovery followed.

In the following case[4] we were much hampered by his alcoholic condition. In the first place, the vomiting was mistaken for the results of drink; in the second place, he was very intolerant of discipline; and in the third, his general condition was very unsatisfactory from chronic alcoholism.

Case 5.—On the night of 4th April 1898, a man, æt. 27, who was crossing Whitehall when in an intoxicated condition, was run over by a two-wheeled van. He was taken to a hospital near, but was refused admission, so was brought to St. Thomas's about three-quarters of an hour later. He could give no coherent account of the accident, but complained of pain in the abdomen, where there were marks of wheels. Pulse fairly good; temperature normal. A scalp wound had been already stitched up, and he was taken in because of his drowsy state. At midnight his temperature was 100·2. He commenced to vomit a clear fluid smelling strongly of alcohol, and this continued all through the night till 9 o'clock on the morning of the 5th, when he complained of pain over the abdomen, which was very sensitive to the touch and very resistant. Pulse 160; very small. I was asked to see him at 2 P.M., when his condition was practically the same, but there was still no local change to be found on percussion. Immediate operation was performed, at which a large quantity of sero-purulent fluid was evacuated, and a rupture measuring ⅜ in. in length in the long axis of the bowel was found 12 in. from the ileo-cæcal valve. Eight Lembert sutures were sufficient to close it. There was a good deal of lymph in the surrounding coils. The abdomen was cleansed with sterilised water, and a drainage tube passed into the pelvis through a second opening; the upper wound was closed. Ten days later the upper wound gave, two days after removal of sutures, and there was protrusion of small intestine. This protrusion was washed and replaced, the wound being again sutured. The patient, who had been a heavy drinker and suffered from albuminuria, was difficult to manage, having on one occasion got out of bed soon after his operation and walked about the ward during the night. Following on the second application of sutures, the wound suppurated, and he ultimately died on the 30th of April with lung symptoms. At the post-mortem examination the abdomen was almost normal, with the exception of a small retrohepatic abscess on the right side. The gut was firmly healed. The lower lobe of the right lung was collapsed.

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[1] Curtis gives the following per cent. according to position: Duodenum, 6 per cent.; jejunum, 44 per cent.; ileum, 38 per cent.; other parts, 21 per cent.; large gut, 4 per cent. The statistics of St. Thomas's Hospital, 1887–1906 inclusive, give: Duodenum, 4; jejunum, 10; ileum, 11; large intestine, 5,—out of thirty cases.

[2] *Trans. Clin. Soc. London*, 1888, 254.

[3] *Trans. Clin. Soc. London.* 1890, p. 141.

[4] *Lancet*, London, 1898.

Dr. R. Playfair Campbell,[1] in discussing this question—rupture of the intestine—after reading notes of a case in which successful operation was performed for a rupture due to strain, continues: "The diagnosis of this case was reached through no one symptom, but of the symptoms coupled, which included, briefly expressed, signs of shock, gas, fluid, inflammation in the peritoneal cavity, mainly, however, through the severe initial pain which continued, and especially to muscular rigidity, which also continued. This latter fact is important, as it is not infrequent to find cases which have sustained abdominal blows exhibit a tenseness of the abdominal muscles shortly after injury, which, however, disappears in an hour or so. It has been our habit here to trust much to this sign in all cases where solution of the gut comes in question, and although undoubtedly sometimes at fault, more especially in cases of typhoid perforation, yet no sign deserves precedence. French surgeons have perhaps insisted on this more than other nationalities. Hartmann reports thirty-seven cases of contused abdomens in seventeen of which this sign was present, and in all these rupture was demonstrated. Peritonitis should be well started in six hours, and except in cases where leakage is directly into the pelvis much may be trusted to this sign. Vomiting is an invaluable adjunct, but too often delayed."

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[1] *Ann. Surg.*, Phila., 1905, vol. ii.

It is not too much to remind you that the earlier operation is performed the better the chance of recovery of the patient. Many of these cases are complicated by other injuries and by shock, but in a very considerable number the damage to the intestine is the only thing that matters, and if that is repaired the result will be good. In the thirty cases under observation at St. Thomas's Hospital from 1887 to 1906 inclusive, five were not submitted to operation, twenty-five were operated on. Of these six recovered, a very high percentage of recoveries. The importance of time is shown by the fact that two of them underwent operation six hours after the injury, whilst in the others it was six and a half, seven, eight and a quarter, and fifteen hours respectively. Moreover, the patients who died after operation four weeks, three weeks, and six days respectively, underwent operations eighteen and a half, seven, and seven hours after the accident.

THE DIAGNOSTIC VALUE OF RADIOGRAPHY IN TUBERCULOSIS OF BONE—WITH RADIOGRAMS.[1]

By Alexander Don, M.A., M.B., C.M., F.R.C.S.Ed., *Surgeon to the Royal Infirmary, Dundee.*

(Plates VIII.–XI.)

The advantage of an early and accurate diagnosis of tuberculous lesions in bones can hardly be overestimated. As in tuberculosis elsewhere, it is only in early cases that we can look for a complete cure; later, we may arrest the disease, but often at the risk of considerable deformity. We possess in the X-ray a means of detecting the disease almost at its commencement, certainly before any great amount of damage is done, and we are saved from the accusation so frequently, and I am afraid so often truthfully, made, that we misunderstood the disease, and treated a serious tuberculous lesion as rheumatism or neuritis, and sometimes even as hysteria; always expecting something to turn up which would help us to form a correct diagnosis. Among the few radiograms that I shall show you to-night are cases which have been painted, poulticed, and blistered until the patience of the sufferer led to a change of physician, though not always to a change of treatment.

I take the following from a well-known text-book of surgery:

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[1] Paper read before the Forfarshire Medical Association.

"The diagnosis of tuberculosis of bone is easy in the case of primary tuberculous periostitis, but may occasionally be doubtful for some time; but still its beginning and subsequent course in different parts of the body is generally so typical that the diagnosis is not very difficult."

I would like to impress on you the advantage of diagnosing the beginning, and not waiting till the subsequent course makes diagnosis easy. A radiogram, though not very diagnostic, is a great aid along with the clinical symptoms.

If the case is likely to require operation, we are able to plan our operation almost completely before making a single incision. Nay more, we can even predict with fair accuracy the amount of deformity likely to ensue, and the probability of being able to eradicate the disease, and can thus approach our patient with a definite proposition. We can even, if we care—and this may sometimes be advisable—show the relatives the radiogram, and explain to them the amount of destruction already caused by the disease, and the further destruction of tissue that may be necessary to make the operation successful.

But we must not expect too much from a radiogram in tuberculous disease, and more than one plate must be taken if the extent of the disease is not fairly evident from the first view. Softening, which is due to removal of inorganic salts, will show in the plate as a darker area, and this must not be confounded with a naturally thin part of the bone such as we see in the radiogram of the lower end of the humerus. Complete erosion of a part of the bone may also show as a darker area in the plate, but it may show too as an irregularity in the contour of the bone, with a dark area indicating its depth. To see the lesser lesions, we must study the negative carefully, and this is best done by means of a view-box, by which every little detail of light and shade can be clearly seen and its value noted; or, better still, by means of the stereoscope, which adds as much to the reality in radiography as in ordinary photography. It is a painful experience to a surgeon to open a tuberculous abscess, say in the thigh, and to be unable to find out whether the original focus is in the hip-joint, in the femur, in the pelvic bones, or in the spine, and to have simply to drain the abscess cavity, knowing well that he has done nothing towards a cure, especially if he reflects that a radiogram would have saved his own time and reputation, and the patient a useless and dangerous operation: for all surgeons recognise the added danger of septic infection along a tuberculous sinus leading to disease of bone. It is even worse for ourselves to have another surgeon called in, and to find the same disease treated and arrested by quite a different operation. It will perhaps be better, in discussing this subject, if I follow the more or less artificial classification of the disease into stages, namely—

Stage 1 might include periostitis, erosion of cartilages, and small tuberculous foci in the substance of the bone itself. Here the radiogram is perhaps most essential to a correct diagnosis, for except pain, there may be absolutely no symptom.

Case 1.—I may refer to the print of the right hand of a girl of 15 years of age. There is no family history of tubercle, but almost every year since she was 8 years old, the forefinger has been treated in various ways, by painting with iodine, poulticing, and liniments. Pain has never been entirely absent, even when no swelling was noticeable. When I saw her first, the metacarpal of the forefinger was painful on pressure, and there was also pain in moving the metacarpo-phalangeal joint. The radiogram showed a periostitis, with osteophytic thickening of the lower end of the metacarpal. Complete rest in a poroplastic splint for six months entirely removed the objective symptoms.

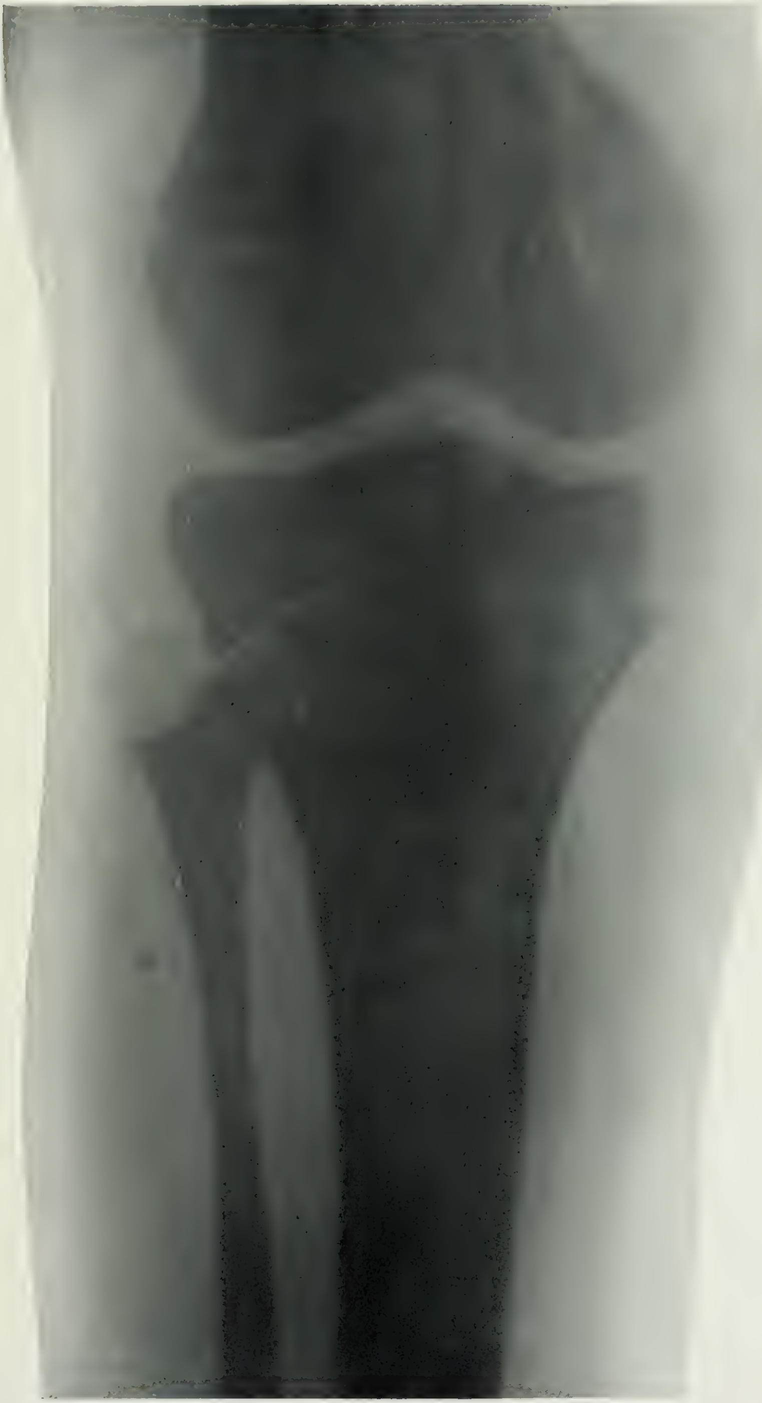
Case 2.—In another case with an almost similar history, I was unable to make up my mind whether I had to deal with a tuberculous ostitis or a teno-synovitis. I radiographed the arm, and I then proposed immobilisation for a lengthened period, but even with the radiogram before them, the relatives had my patient off first to a bone-setter and then to Edinburgh to see a professor.

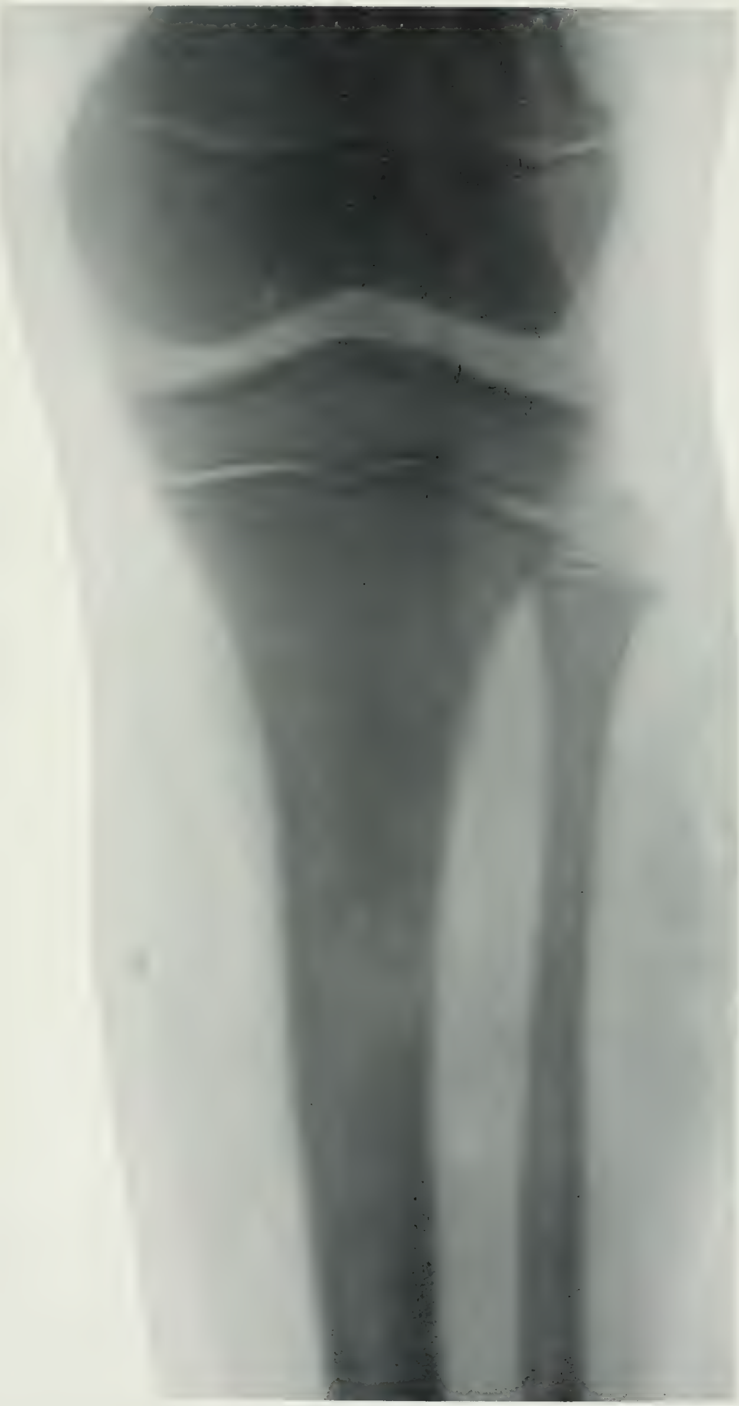
Case 3.—The next case was that of a boy who had fallen out of bed only three weeks before I saw him, and had complained of his leg ever since, but not so much in the morning as later in the day. I thought I had to deal with a periostitis, probably combined with a greenstick fracture; and the thickening of the tibia, the pain over a particular point, and the marked pitting on pressure, all pointed, I thought, to this lesion. The radiogram showed universal thickening of the diaphysis of the tibia, especially in the lower two-thirds—a somewhat rare tuberculous condition in a long bone. The thickening, which is due to osteophytic formation, must have taken some time to reach its present condition, and the fall had probably no causal connection with the disease. Previous to the fall, there were, however, apparently no symptoms, and this is not unusual in tuberculosis of bone, unless a neighbouring joint or epiphysis becomes affected.

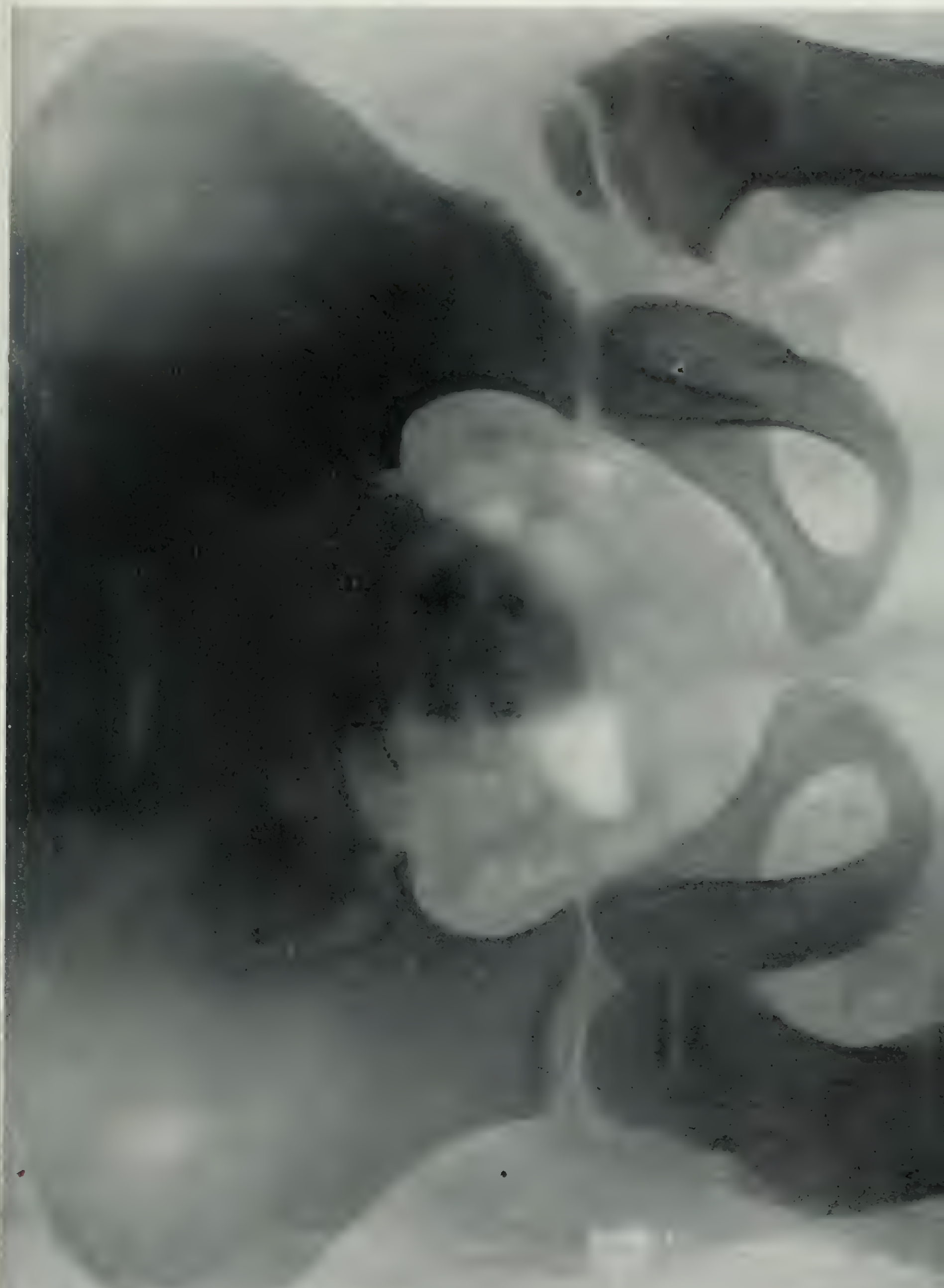
Now, all these cases belong to a class that rarely comes into our hands at this stage. The family physician must paint, poultice, anoint, and that often, I believe, without the least idea in his own mind as to the ultimate benefit to be derived from his treatment. Much would be gained by a radiogram to both physician and patient.

Stage 2.—With this stage of the disease surgeons are more familiar, for time has helped the diagnosis, if not the patient. The bone has begun to soften, and the surrounding tissues and joints are swollen. There is no doubt now that we have to deal with tuberculous bone disease. But to what extent is the bone affected? A radiogram alone can give a definite answer to this question.

Case 4.—In a case of disease of the ankle, there was flat-foot on







both sides, but more than the usual pain about the ankle-joint, and behind the right external malleolus was a particularly painful spot, which the family doctor blistered, and which developed into a distinct tuberculous ulcer. The radiogram showed distinct thinning of the lower end of the fibula, and on the left fibula spicules of osteophytic formation extended some 2 in. up the shaft. The patient had other tuberculous lesions, so that there was no doubt of the nature of the trouble.

Case 5.—In the next case (Plates VIII. and IX.), a radiogram was taken of both knee-joints. The left knee was slightly thicker than the right, and fuller on the sides of the patella, and the history pointed to tuberculous arthritis; but much more can be learned by the surgeon from the print, and even more from the plate itself. Compare the epiphysial lines on both sides. They are more indistinct on the left leg, though both are probably affected. The space between the bone is blurred in the left—probably the cartilages are eroded, and the joint filled with tuberculous débris. In the femur above the epiphysial line is a slightly clearer space. This is no doubt due to absorption of the earthy salts and softening, and we would look for this in the intercondyloid notch, and expect also to find destruction of the crucial ligaments.

Surely such a picture is a great help to the surgeon in planning an operation on this knee.

Stage 3.—In this I may include all cases where there is loss of substance with cavitation, necrosis, erosion, etc.; and even here we may be able to get some assistance from the X-ray. We may, from the picture, decide not to operate at all, but if we do operate, we can make straight for the disease.

Case 6.—Here is a print of a hip-joint (Plate X.) that was taken not so much for diagnostic purposes, as to save my own reputation. The child's mother when on a holiday consulted a doctor friend, who gave her the impression that the hip was being neglected and bungled. Two years previously the joint had been incised and a tuberculous abscess cavity drained, and it was now suggested that there had been a dislocation, which had not been reduced. The radiogram quite convinced the mother, though it may not have enhanced her opinion of her friend's ability.

Case 7.—Plate XI. is from a case that has afforded a good deal of operative experience; both elbows, one wrist, and one knee having been excised, and the leg amputated through the thigh later. You notice the changes in the radius. The plate was taken to find out whether an abscess, that had developed on the back of the wrist, was connected with the bone or simply superficial as it appeared to be. The plate shows the wrist bones quite unaffected.

I hope in these few notes that I may have persuaded some of you of the advantage of radiographing all doubtful bony lesions, and I am sure that neither you nor your patients will have any ground for regretting your doing so.

DELAYED SPEECH IN CHILDREN.[1]

By W. S. Syme, M.D. (Edin.), *Assistant-Surgeon, Ear, Nose, and Throat Hospital, Glasgow.*

There are certain periods or marking-places in the early history of a child, concerning which the medical man, on his first appearance in the arena of professional practice, is in most cases so ignorant, that one is inclined to agree with the frequently-expressed opinion, "A mother of a large family could give points to a young doctor in the management of children." However this may be, there is no doubt he often fails to, at any rate, relieve anxiety through inability, by lack of the necessary definite knowledge of a child's early days and development, to answer the questions of the anxiously-inquiring parent. We all know at what age the teeth appear and in what order, but "When should baby take notice? Is the smile the fond mother sees in the baby's face, almost as soon as he is born, a smile of recognition; or has it a more prosaic genesis—wind? When should the child begin to crow and evince an interest in his surroundings? When should he begin to understand what is said to him? When should he walk? When should he talk?"—all questions that are fired at the head of the medical man, to be answered by him in most cases as his mother-wit suggests. Happily some put themselves *in loco parentis*, and thus gain by experience the knowledge they have otherwise failed to acquire. To others, unfortunately, such a consummation has not been permitted by the gods. They cannot study the problem, so to speak, from the inside.

But, seriously, we all know with what great anxiety the mother, at any rate, watches her child—the cynic may say "the first especially," and if it gives him pleasure we will allow him his joke—develop and come to and pass the various landmarks which she has set up to mark his progress. How often the question is put: "Is baby all right, doctor? He doesn't cry much." Or, on the other hand, "Baby seems to be all the time crying"—this from the father usually—"Do you think he's right in his head?" "Don't you think baby should be taking notice now, should begin to laugh and play? should begin to speak?" and so on. Now, of all these questions, I think I am safe in asserting, there is not one which is so anxiously put to the medical man as that relating to the child's speech, and if the advent of this faculty should be delayed beyond the time at which the parent has been led to expect it, even those members of the profession who, to their happiness—if that be possible—or to their unhappiness, still remain outside the Benedict state, will be able to understand the increased anxiety. It is then that a knowledge of the conditions which act in delaying the development of speech will enable the medical attendant to allay the parents' fears; or, if unfortunately his interpretation of the case in the light of his knowledge will not permit of this, then to prepare their minds for the confirmation of their forebodings.

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[1] Read before the Glasgow Northern Medical Society, January 8, 1907.

Now, a little consideration will make it evident that speech in its process of development is not the simple matter that it appears to be in its fully-developed state in the adult. The child in the early months of his life is—and I hope fathers will forgive a father's remark—much of an animal and little of a human being. This is well seen in the growth of what I should call at this stage, its faculty of articulation, for speech proper is, I take it, the product of mental activity or of reason, however unreasonable it may sometimes appear in its abuse. We can observe the child develop through the period of cryings and crowings, of screams by reason of his empty stomach, and of grunts because of his gastric repletion. Observation of these sounds should not be neglected. They may give valuable indication as to his early mental development. and therefore as to the development of the faculty we are considering. Soon he will begin to take an interest in things outside his digestive apparatus, and in connection with articulation it will be noticed that he begins to mimic sounds, or, in other terms, to put words of his own invention to sounds he becomes familiar with: cries of animals, the ticking of clocks, the ringing of bells, and so on, suggest themselves in this connection. As we know, many words of the English language and of every language, I imagine, for the matter of that, originate in this way. One of my own children—excuse the personal observation—for a long time called water "oogly" because of the noise it made in escaping from his bath.

About the end of the first year, the normal child delights his parents by clinching his relationship to them by uttering sounds which are taken to be "mamma," "dadda," and we know the eagerness with which the priority of their emission is debated. Ask him, and he remains mute as the Sphinx. "His wisdom," you say—his ignorance in reality, for at this stage he merely gives utterance to a catchy sound he has heard—often enough in all conscience, and which may be likened to the bow-wow of the young puppy, or the mew-mew of the kitten, and for some time still it will be observed that many of his expressions are cast in the same double mould—"baba, tata," etc. This is the period at which we may put the definite commencement of intelligent speech, and it begins by the appreciation of the significance of these common sounds, which now we may call words, conveyed to the waiting mind through the organ of hearing. He gradually becomes accustomed to associate "mamma, tatta," and so on, with definite objects, and so his first, and I think we may say, his most important lesson in life is learnt. He has learned to understand spoken speech. From this it is but a step, slowly—sometimes very slowly—and haltingly taken, to be sure, to the production of speech, the return current, so to speak. By this time the young pupil is well into the first six months of his second year. To put it differently, we may say that by the time the child is 18 months old, we should be able to observe distinct signs of the advent of the faculty of intelligent speech, and by the end of the second year this should be definitely established. When it does not appear before the end of the second year, we look upon it as delayed; if it appear before the end of the first year, we describe it as precocious. This gives a margin wide enough to include variations which we get in different countries, in different localities, and under different modes of living.

Now that we have considered the outward and visible, or rather audible, sign of the inward and mental process which has been going on in the young mind, let me briefly, and without tiresome detail, sketch the pathway concerned in this development of speech. The sound of the word is conveyed by the organs of hearing and the auditory nerves to the auditory word-centre, or rather, word-centres, for it is probable that in early life the superior temporo-sphenoidal convolution on each side is concerned in the reception of spoken words, and it is only later and gradually that this function is delegated to the left side. *En passant*, it is interesting to notice that this pre-eminence of the left auditory word-centre holds good, as a rule, even in left-handed people, judging from the results of post-mortem examinations of left-handed persons who have suffered from acquired word-deafness, but, as Kipling says, "that is another story." To return: From the auditory word-centres the impulse is conveyed to the so-called motor speech-centre or Broca's convolution by way of the commissural tract. Thence it travels down the pyramidal tracts to the motor-centres in the bulb and cord, which send out impulses calling into action the muscles concerned with the complex mechanism of speech. Now, it is evident, I take it, that any abnormality in this tract, any, so to speak, break in the chain, must interfere with the production of speech, and if this should occur in the young child, it must delay or altogether prevent the development of this faculty. To describe in detail those aural conditions which may give rise to temporary or permanent deaf-mutism, and to weigh the probability of one or other result accruing from them, would extend this communication to intolerable length. Still, in endeavouring to arrive at a correct appreciation of the seriousness of the delay, these various diseases of the ears must be borne in mind, as they are of the highest importance in relation to delayed speech. But even before prosecuting inquiries in this direction, we first ask ourselves, "Is the child mentally sound?" Indeed, if the question does not at once occur to the medical attendant, it will in all probability be anxiously suggested to him by the child's parents. In this connection we must take into consideration the relation of the child to the periods which precede the time of the usual appearance of speech. Has he taken notice as other children? Has he crowed; yes, and scolded and shown his likes and dislikes as healthy children do? Which of us have not stood, as it were, in the dock, with the healthy infant of say 10 months old as judge and prosecuting counsel in one, by the aid of a vocabulary of his own invention, reinforced by gestures and contortions worthy of an enthusiastic if not over-fluent divine, calling down terrible, because unrecognisable catastrophes on our heads, because we have, either unwittingly or of malice aforethought, interfered with his pleasure? And without doubt it has frequently been our pleasure to receive, by the means of his smiles, crowings, and playful antics, his appreciation of our—it may be grotesque—efforts for his entertainment. By carefully watching the child at his play, it is not, in most cases, difficult to decide as to his intelligence, but, unfortunately, it is just in those cases which we are considering, those of delayed speech, where this difficulty does arise, and in which in some cases it is well-nigh insolvable. It is not within the province of this paper, and indeed I must profess myself incompetent to discuss the signs of imbecility, but it is necessary to keep this possibility to the fore in reference to the subject of this communication. Let me first dispose of what I may call the purely aural side of the subject, that is, the diseases and malformations of the different parts of the ear, which, occurring in young children, give rise to delayed speech. This, as I have before remarked, is a big subject, worthy of a treatise rather than of a short paper. The grosser conditions, such as absence of various parts of the organs of hearing, occlusion of foramina, etc., have to do rather with deaf-mutism than with delayed speech: and the same may be stated of the more destructive results of middle-ear disease and of the implication of the auditory nerves in basal meningitis. There is one ear affection, however, which, in its bearing on delayed speech, calls for more than passing mention. I refer to the middle-ear condition which is due to the presence of adenoid vegetations. Common as these growths are in somewhat older children, it is a matter for thankfulness that they do not with any frequency occur before the age at which children normally begin to speak. That they are found sometimes during the early months of life is, however, undoubted, as those of us who are engaged in throat and ear work can testify. We are all conversant with the defects of speech caused by these growths in older children, nasal articulation, stammering, defective articulation of certain letter sounds—all of which disappear more or less completely and more or less quickly after the appropriate operation on the naso-pharynx. When occurring, however, in younger children, they tend to delay the advent of the faculty of speech rather by the accompanying deafness than in a direct manner. No doubt the physiology of the development of speech is of a complex nature, but for our purpose we may take it that the auditory word-centre must be trained up to a certain degree of activity before it becomes capable of producing, in the motor-centre for speech, a sufficiently strong impression to cause it to act on the associated motor nuclei in the pons and medulla. This may fail because the training of the auditory word-centre is interfered with from the afferent side, or the fault may lie with the centre itself, which may fall short of the normal capacity for training. Let me cite a case of my own. A boy of 4½ years was sent to me by his family medical attendant because he had never spoken, and the deafness, though not absolute, was so marked that his parents feared he would be a permanent deaf-mute. There was no history, and on examination no signs of middle-ear suppuration, nor of any previous illness suggesting the possibility of former meningitis. The child was evidently very deaf, though, on account of his fright, which is in my experience frequently extreme in young subjects so affected, it was impossible to make a detailed examination. A large mass of adenoids was found in the naso-pharynx. As is my habit in such cases, I recommended the removal of these, but warned the parents not to be too confident of an improvement in hearing and subsequently in speech. This is in consonance with my experience that adenoids alone do not, as a rule, give rise to a high degree of deafness. Fortunately, in this case, this rule was honoured in the breach. A month after the operation he was brought back to me, much improved in respect of his hearing, but he had not as yet spoken. When, however, I proceeded to examine his throat, he suddenly exclaimed, "Oh, daddy!"—much to his mother's astonishment and delight. Since then he has shown progressive improvement in speaking, and now goes to school. This case is comparable with the historic case referred to by Wyllie in his book on "Disorders of Speech." The son of Crœsus, who had never been known to speak, and who yet was old enough to be present at the siege of Sardis, was so overcome with terror at the sight of a Persian soldier attempting to kill his father, that he cried out, "Oh, man, do not kill Crœsus!"—I leave the pedagogue to supply the Latin equivalent. Here, for obvious reasons, the operation for the removal of adenoids did not play a part, but it is at any rate permissible to surmise that their atrophy removed a degree of deafness which left an unimpressionable auditory word-centre open to stimulation. It is interesting to notice the action of fright in these two cases in increasing the activity of the auditory and motor word-centres. It is a well-known fact that these centres may be temporarily paralysed by fright, and it is not difficult to understand that the opposite effect may be produced in those in whom speech is to a greater or less extent delayed.

Though cases, in which complete absence of speech is found as a result of adenoids, are decidedly rare, it has been my fortune to see a number of children, the subjects of these growths, and of varying ages up to 12 or 14, in whom speech production was so rudimentary as to be fairly described as delayed, and in whom distinct improvement has resulted from the eradication of these vegetations. These cases, however, I look upon as due not so much to the aural condition as to the functional cerebral disturbance so frequently associated with the presence of large adenoid masses, and to which the name of "aprosexia" has been given by Guye. In these cases the receptivity of the word-centres and the activity of the other parts of the brain concerned in the production of speech suffer with the general mental dulling. An abnormal lack of activity of these centres is also got, apart from adenoids. Heredity appears to play a part, for I have seen cases where the delay in the advent of speech was observed in succeeding generations and in more than one member of the same generation. Rickets, congenital syphilis, as well as other debilitating illnesses, have a retarding effect. Infantile convulsions and epilepsy may delay the establishment of the faculty of speech, or may cause temporary loss of speech after it has been established. In some apparently very rare cases, it would seem that the developmental defect is localised to the auditory word-centres. Such a case was reported by me to the Laryngological Section of the British Medical Association Meeting at Oxford, 1904. This boy, æt. 9, could not be made to understand speech, and had never spoken, though in every other respect he was most intelligent and bright, and his hearing for other sounds—music and so on—was quite good. The case is fully described in the *British Medical Journal* for that year. At that time I was under the impression that no similar case had been described, as a careful search, so far as I could make it, had failed to discover one. I find, however, that Dr. Kerr, at present Medical Officer for Schools to the London County Council, had previously shown a similar case at a meeting of the Bradford Medical Society, and since the Oxford Meeting he has been good enough to send me a copy of his report to his Council for 1903–4, in which he gives details of a second case of pure congenital word-deafness. Another, making four in all, of which I have knowledge, was described at a meeting of the American Laryngological Society in the summer of 1904. All are practically identical in detail. It is three years since my case came under my notice, and the last account I have of him is that he is slowly increasing his vocabulary. These cases are comparable with those of congenital word-blindness, with which Hinshelwood has made us conversant; but if I may say so without appearing egotistic, the diagnosis of this latter condition is more easily arrived at, in view of the fact that the visual word-centre normally becomes active at a much later period than is the case with the auditory word-centre, and the exclusion of the question of imbecility is not so difficult.

Last of all, speech may be delayed by reason of actual intracranial lesions, and here we must recognise the Scylla of deaf-mutism on the one hand, and the Charybdis of imbecility on the other. Still, there are cases in which small and localised lesions have led to delay and not to destruction. They act by temporarily paralysing the word-centres themselves, or the commissural or motor tracts in relation to them. It is no doubt thus that whooping-cough in rare instances affects this faculty by reason of minute cerebral hæmorrhages, and it is conceivable that brain abscess, localised meningitis, or some abnormality of the intracranial circulation, may have the same result. The arrested development of Broca's convolution has been described. As regards the treatment of delayed speech, there is little to be said. Where a removable cause can be found, it should, of course, be dealt with. If the delay is not extended beyond four years of age, the child will quickly make up his leeway. Every successive year adds to the anxiety. One word of warning: these little patients should not be treated as deaf-mutes. Every case should be carefully examined before the appropriate method of education is decided on. Needless to say, we have here another strong argument for the institution of special facilities for the education of defective children, and for the systematic medical inspection of schools.

ON BIER'S TREATMENT OF ACUTE INFLAMMATORY CONDITIONS BY HYPERÆMIA.[1]

By D. M. BARCROFT, *Student of Medicine, Edinburgh.*

In approaching the subject allotted to me by the Royal Medical Society for my Dissertation, I have been greatly surprised at the almost entire absence of literature on Bier's congestive treatment in English. The paper read before the Medico-Chirurgical Society of Edinburgh by C. W. Cathcart is, so far as I can ascertain, the only recent English account of Bier's work.

Further, it is interesting to find at the German Surgical Congress of 1906 a unanimous opinion expressed in favour of the treatment, while in this country it is generally considered still to be in the experimental stage.

In dealing with the subject, we have of course taken Dr. August Bier's "Hyperämie als Heilmittel" as our guide—a work which has run through several editions in rapid succession, and is now much larger and more comprehensive than when it first appeared four years ago.

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[1] Being part of a Dissertation read before the Royal Medical Society, February 22, 1907.

It is difficult, within the space usually occupied by a dissertation, to give at all an adequate picture of what Bier requires almost five hundred pages to sketch. Further, as some members of the Society have worked at Bonn, and many, if not all, are familiar with the general lines on which the treatment is carried out, it is undesirable to make this a miniature reproduction of Bier's book. The theoretical aspect of the subject, fascinating as it is, will be dealt with very briefly, while the practical side will be considered at greater length, particularly with reference to the treatment of various acute conditions.

Inflammation, as every one knows, is a term which has been handed down to us from a time before bacteriology had come into existence, and which was very loosely applied. It was employed to cover a state of matters in which there was pain, redness, heat, and swelling. Even as recently as the publication of Hilton's classical lectures on "Rest and Pain," the exact nature of inflammation was quite unexplained. The phlogistic theory of the eighteenth century had not been supplanted by anything more exact, and our treatment has not materially altered since those days, except in so far as all surgical treatment has been modified by the Listerian system. We have been too apt to look on inflammation, as we used to look on fever, as something hurtful in itself, and which should be removed by so-called antiphlogistic measures, such as blood-letting, purgatives, low diet, etc., or by surgical means, such as free incision. Fever is now recognised as a reaction of the tissues designed to counteract the effect of certain bacteria and their toxins. The day of antipyretics has to a large extent passed, and we recognise in the intensity of a fever the extent to which the tissues react to overcome the poison. When there is reason to believe that a considerable dose of poison is in the system, and that the fever does not correspond to it, means are taken by many to increase, by such drugs as nucleic acid, what they consider to be an essential element of the reaction.

In dealing with inflammation, no such line of treatment has hitherto been in vogue; the inflammation is combated by antiphlogistic remedies, and the bacteria and toxins are separately removed by measures from the outside. Bier, however, has studied the various elements in inflammation, and has based his treatment on what appears to be rational lines. Bier holds that the destiny of fever and inflammation are identical. In support of this contention he quotes John Hunter, who said, speaking of adhesive inflammation, "There appears here to be a wise provision whereby nature has equipped the body with a powerful means of self-defence." Marchand also said, "We can no longer in our comprehension of the phenomena of inflammation consider it altogether hurtful." To Hippocrates has been attributed the aphorism, "Fever purifies the body as by fire."

The great physicist to whom we owe our present conception of inflammation is Metchnikoff, whose work has been supplemented by the theories of such men as Ehrlich and Wright.

The great central idea is that of phagocytosis, which is so well understood that it calls only for mention, and the rest is but the means which brings it about, and the results which lie in its wake. It is, however, a mistake to think that this, vastly important process though it is, does not permit other processes to proceed *pari passu* with it. There is, for instance, the bactericidal property of the blood. This for a long time was denied by Metchnikoff, who, however, was forced to admit, in studying the rôle played by each individual type of leucocyte, that the function of the eosinophil under certain conditions is not that of ingesting bacteria, but of secreting a powerful solution inimical to their life. On the question of the bactericidal properties of blood serum, Park says:[1]

"The bactericidal effect upon most bacteria of the blood serum, noted by Nuttall in 1888, is now undisputed, and is readily shown by the fact that moderate numbers of bacteria when inoculated into freshly drawn blood usually soon die, and this destruction may be so rapid that in a few hours none of millions remain alive. Even when some of the bacteria survive, there is for a time a decrease in the number living. That this effect of the blood is due to substances in the serum, and not due to serum as such, can be proved by the fact that not only by injecting bacteria into the blood and peritoneal cavity, but also when the bacteria are placed in the animal body after being enclosed in capsules or into serum contained in test tubes, the bacteria are killed even if they have previously grown outside the body in inactive blood serum. Bacteria have also been injected into a vein carefully ligated above and below, and here, without coagulation, the blood exerts bactericidal properties. The germicidal effect of any sample of blood serum on different varieties of bacteria is unequal, and can be watched outside the body. Here, mixed with it, some species of bacteria die quickly, and some lose only a portion of their number, those remaining alive after a time rapidly increasing. The number of bacteria introduced is of great importance, for the serum with its contained substances is capable of destroying only a certain number, and after that loses its bactericidal properties." Thus, before leucocytosis can supervene, we may presume that mild doses of many kinds of bacteria are dealt with effectively by the serum in exact proportion to the amount of serum, and inversely to the numbers and virulence of the bacteria.

From conceptions of inflammation let us turn for a moment to physiological hyperæmia. I quote Bier's observations. (1) Every organ which functionates is hyperæmic during its activity. (2) All growth and repair is evidenced by hyperæmia, which moreover is in proportion to the energy of the process; for example, consider the great hyperæmia of the uterus throughout pregnancy.

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[1] Park, "Pathogenic Micro-organisms, including Bacteria and Protozoa," 2nd edition, p. 162.

Without going into this subject further, these two simple observations alone justify one in thinking that Bier rests on firm ground when he essays to treat inflammatory invasion of the tissues by hyperæmia.

At the outset Bier draws a distinction between active hyperæmia in which there is increased flow of arterial blood, and passive hyperæmia in which the venous return alone is interfered with. He quotes the familiar instance of the lung when there is heart failure and consequent backward pressure causing passive hyperæmia of the lung capillaries, whilst the arterial supply, as long as the left side of the heart remains intact, remains the same.

Active hyperæmia can be produced in many ways. As an instance of that produced through the nervous system might be mentioned the intense hyperæmia which is induced by the reaction following the firm application of an Esmarch's bandage to a limb for a short while, or massage of muscles, or electricity. Then there are the rubifacients which follow the old law, *Ubi stimulus ibi affluxus.*

Practically, however, Bier prefers *heat,* and attains his end with the hot-air bath. I need not here go into the plethysmographic and other proofs he adduces to prove his contention, nor need I quote his exposition of the relative claims in this respect of balneotherapy and hydropathy, because this branch of his treatment is valuable in the treatment of chronic rather than of acute conditions.

Before proceeding to discuss the methods used for producing passive hyperæmia, I wish to touch briefly on the subject of *pain.* In the old conception of inflammation pain was given a place as one of its chief features. According to our newer views, pain is as it were an accidental factor not constantly present. No surgeon would contend that its mere relief or aggravation had of necessity a direct influence on the inflammation. However, as pain is perhaps the most distressing feature to the patient, and as the incidence and continuance of pain greatly complicate the treatment of an inflammatory condition, any measure which will relieve the intense agony often associated with acute inflammation must be welcomed. Bier's treatment, when applied to acute inflammation, succeeds in diminishing or abolishing pain in a most striking degree, the simplicity of the application and the wonderful result surprising alike the surgeon and the patient.

When we come to discuss the pathology of pain, we are on what is largely theoretical ground. It is a known fact that the œdema produced by the injection of normal saline, without the addition of any drug, such as cocaine, produces a degree of anæsthesia. It is also a common experience that the pain of an incipient gumboil largely disappears when the part swells or becomes œdematous. Bier explains this in one of two ways: either that the local œdema separates the nerve ends from the toxins, or at all events serves to dilute the toxins greatly, and presumably prevents or greatly mitigates the irritation of the nerve ends; or that the œdema equalises pressure so that there is no set of contiguous nerve ends pressed on more than another.

Passive hyperæmia, with which this paper is particularly concerned, is produced over small areas by the cupping-glass, in larger areas by the suction apparatus, and in the limbs by means of an elastic bandage. The first is an ancient treatment which has fallen into the background, while the last, though associated in our minds with Bier's name, was used by Ambrose Paré, Thomas, and others in cases of fracture to facilitate callus formation.

When an elastic bandage is applied round the upper arm so lightly that it causes no inconvenience, the subcutaneous veins swell, the arm becomes in part bluish and in part rosy red, and the back of the hand and fingers become bright red; later, the parts become bluish red, and ultimately œdema supervenes.

After, say, ten hours the circumference of the limb may be increased by about three-quarters of an inch, and at the end of twenty hours by more than an inch.

There is a corresponding change in the temperature of the limb. Ten minutes after the bandage is applied the temperature falls about 1°·5 F.; in an hour it has risen to normal; and it goes on rising for an hour and a half, then falls a little, but settles down 0°·75 F. above that of the rest of the body. According to circumstances, there may be a range of from 2° to 5° F.

It is only when the bandage is applied so tightly that the arterial circulation is interfered with, that the limb becomes painful and the bandage cannot be tolerated.

Bier recommends the use of a Martin's bandage or an elastic bandage, about 2¼ in. in width, to be applied over lint, the first time immediately above the elbow, the second time higher up. Originally, when it was desired to render the region of the elbow hyperæmic, he advised that the forearm and hand should be bandaged with a domette or cotton bandage. More recently, however, he has used a much broader elastic bandage and included 4 or 5 in. of the upper arm, and has done away with the bandage over the peripheral part of the limb. For the shoulder he passes under the axilla a piece of rubber tubing, the ends of which he fastens together with a pair of artery forceps over the junction of the middle and outer third of the clavicle, and with a handkerchief passed round the neck and a tape under the axilla of the opposite side he prevents it slipping outwards. If this does not compress the vessels it can be padded with soft flannel or wadding. Another method is to cover a ring of strong elastic tubing with flannel so that it is about an inch thick, slip it over the arm, and keep it in position by a broad strap passing under the opposite shoulder. This shoulder congestion is not to be applied for more than twelve hours a day.

For fourteen years Bier has been treating acute inflammation with passive congestion. At first he treated gonorrhœal joint inflammation, then selected cases of osteomyelitis, and every year he has widened the circle of his experiments, until now he has recorded cases of almost every variety of acute inflammation in almost all parts of the body treated by some variation of his method. As he himself says, he has gradually had to part with an immense amount of prejudice engendered by his antiphlogistic training.

The technique for acute inflammation is as follows:—The bandage should be applied for twenty to twenty-two out of the twenty-four hours. In the intervals the part should be elevated so as to lessen the œdema produced by the bandage. The bandage is again applied and fresh œdema replaces that which has been drained off. The results of briefer applications of the bandage with longer pauses have not been so satisfactory. In no case is the bandage to be applied for less than eight or ten hours.

In cases in which the inflammation is so situated that the broad bandage cannot be employed, it is necessary to use the rubber tube bandage, and to apply it for a shorter time on account of troublesome pressure symptoms. This difficulty can be met by taking the bandage off for a short pause now and again, and by hardening the skin with spirits of wine.

In every case the idiosyncrasy of the patient is an important factor, and it must be kept prominently in mind that the bandage should never cause discomfort.

The treatment is intended at first to increase the redness, œdema, and swelling considerably. The cord-like lines of the lymphatics become redder, and, in fact, so does the whole limb right up to the edge of the bandage. This reaction, however, is less intense each time the bandage is applied; permanent increase of inflammatory symptoms points to the formation of an abscess which should be opened. The part must not be allowed to assume a bluish colour, because it is not a stasis that is aimed at.

The following simile, quoted from Bier, is instructive. "I should like," he says, "to compare the blood circulation to a stream watering a meadow by innumerable irrigating channels. If the farmer makes a weir below the meadow, the water flowing off will at first be kept back, but there will be just as much water flowing on to the meadow, and as much flowing off it, only the meadow is a swamp. The weir that we put up in cases of acute inflammation is our bandage applied to the draining part of the circulation; flow and return after all remain approximately the same, nevertheless the tissues are flooded with all the constituents of the blood."

The bandage is kept on for shorter and shorter periods each day as the condition improves, but must be continued for some time after the inflammation appears to have gone away, otherwise the symptoms are apt to be lighted up again if the congestion is altogether removed too soon.

The congestion tends to improve the nutrition of the part, and often aborts a necrosis which would inevitably have taken place under antiphlogistic measures.

The appearance of blisters is an indication either that the bandage has been applied too tightly, or that there is an abscess to be evacuated.

It is quite safe to put the bandage on over inflamed lymphatics, but it should not be too near the focus of infection. Thus, in the case of the finger, the bandage should be applied on the forearm, or, better still, on the upper arm.

Bier describes a sort of pneumatic collar which can sometimes be used as a bandage when the elastic bandage cannot be borne. If dressings are applied over the affected part while the congesting bandage is on, they must be very loose, otherwise they tend to interfere greatly with the hyperæmia.

The patient must be watched very carefully after the bandage has been applied, and should be repeatedly seen at short intervals. For this reason it is best to commence the treatment early in the day, as it is not advisable to let the patient go to sleep until it is known how the bandage is acting. The patients soon come to know what the right tightness is. The accurate adjustment of the bandage is the crux of the whole treatment, as, if it is not applied firmly enough, it is useless, and if too firmly it leads to mischief.

Bier recommends that those who have not had experience of the method should begin by treating—(1) Fresh acute inflammations of every kind; (2) subacute and mild inflammations of long standing; (3) acutely inflamed gonorrhœal and pyæmic joints.

Not until some experience has been gained and the practitioner has confidence in the treatment does he recommend the application of it to osteomyelitis or cellulitis of the tendon sheaths.

Formerly Bier laid great stress on the fact that his treatment was not suitable for the general practitioner, but must be tested by those who had the resources of a hospital at their disposal. He now tends to modify this view, however, as in the hands of many general practitioners brilliant results have been obtained. It is at the same time a fundamental principle that the patient must be continually under the doctor's personal supervision.

The following case shows how a threatening suppuration may be aborted under Bier's treatment.

CASE 1.—On the 4th of February 1904, an almost inoperable scirrhus of the breast was removed from a woman, æt. 60. The wound suppurated freely for a long time. On the 8th April a pyæmic metastasis set in in the left wrist, accompanied by a rigor and rise of temperature to 39·4° C. (103° F.). The joint was very red, swollen, and tender on the surface. Passive congestion was applied at once, and maintained for twenty hours each day. The pain subsided rapidly, and by the 11th of April the affection of the joint had completely disappeared, the temperature was normal, and passive congestion was stopped.

Under the congestive treatment the character and virulence of organisms seemed to be altered so that an acute abscess may assume the characters of a chronic one. In infected wounds, whether post-operative or otherwise, the sepsis aborts, and, where there are abscesses discharging pus, the exudate becomes seropurulent, then serous, and soon ceases. There is thus an analogy between the reaction under hyperæmia and the reaction of the peritoneum to mild cases of infection. In quite a number of cases Bier claims to have cured abscesses without incision, but he does not recommend it as a routine practice. He recommends letting out the pus through a small incision, which only in rare cases exceeds half an inch in length. The indication for wide incisions is when the general circulation is obviously interfered with; in some cases even amputation may be indicated to avoid death from pyæmia.

In tendon-sheath cellulitis, Bier recommends several small incisions, as he considers that opening the tendon sheaths widely prejudices the nutrition and ultimate function of the tendon. At the same time a good lookout must be kept for fresh abscesses under the congestion bandage or elsewhere, the temperature chart being the best guide. Free incisions do not interfere with passive congestion, but they are needlessly disfiguring.

The advantages of the congestion method in these cases are: that the course of suppuration is quiet under passive congestion, the slough rapidly separates, and often where gangrene would inevitably have supervened, the part has recovered. The congestion localises the suppuration. The patient is saved painful and disfiguring incisions, and the function of the part is restored in a manner hitherto deemed impossible. Bier recommends freezing the part with chloride of ethyl in opening small abscesses; but for acute tendon-sheath cellulitis or osteomyelitis, general anæsthesia produced with ether, or spinal anæsthesia.

In exceptional cases he allows an abscess to be drained, but he condemns the practice of packing wounds; it is little wonder, he says, that a tendon dies when surrounded by a foreign body which acts like a lamp wick, sucking away all its nourishment. He recommends that wounds should be covered with sufficiently ample dressings to absorb the serous exudate which he wishes to come away as freely as possible. They must be dressed daily and washed with normal saline or sterile water. Pus should be stroked very carefully out of tendon sheaths.

In many cases of severe infection the effects of the bandage on the temperature is most marked; often in a few hours it falls to normal, and remains down even through the intervals while the bandage is not applied. In other cases the temperature chart shows a marked fall of several degrees while the bandage is applied, gradually rising again when it is taken off.

The most striking results have been obtained by Bier in metastatic gonorrhœal joint affections. As already indicated, he has been treating cases of this condition with the most brilliant results for fourteen years. I give below a typical case from Bier's records, and would just say in passing that Mr. C. W. Cathcart placed before the Medico-Chirurgical Society of Edinburgh an even more striking case, proving the great practical utility of this treatment in cases which have defied all the arts of man.

Case 2.—A man, æt. 20, contracted gonorrhœa three months before admission to hospital. Five weeks previously he was seized with severe pain at the wrist-joint. This was diagnosed to be acute rheumatism, the part was wrapped in cotton-wool. Later it was treated with ice-bags, painted with iodine until the skin was destroyed, and splints were used; but all without benefit. When the patient was admitted, his wrist was greatly swollen, the hollow of the hand was filled up, and there was marked œdema up to elbow, and slight reddening of the skin. The fingers were stretched out, and hand in the position of pronation. Stretching of the tendons was accompanied by severe pain. He had not slept at all at nights for the last few weeks, and as a result his general health had suffered. There was still a gonorrhœal discharge from the urethra. Bier's bandage was applied to the upper arm, and an hour after its application the patient had absolutely no pain. The wrist-joint and the fingers could be submitted to slight passive movement without pain. After one hour the bandage was removed, and an hour later applied again for three hours. After an interval of three hours it was again applied in the evening, as a result of which the patient had an uninterrupted sleep. After removal of the bandage the pain soon reappeared, and the patient was unable to sleep longer. The same treatment was carried out on the following day, the pain disappearing on the application of the bandage, and reappearing an hour or two after it was taken off. The general condition greatly improved, and passive movement could be carried out. The third day he wore the bandage from 3 p.m. until 9 a.m. next morning, except that it was changed once from one place to another, and he slept the whole night through. This was done again the following day. After this, even on the removal of the bandage, pain did not reappear, and swelling was only present to a very slight extent. The patient began to move his wrist and fingers himself. In spite of passive congestion, in four days the circumference of the joint was considerably reduced, as was well seen by the wrinkling of the skin. Ten days later light massage was commenced, but had to be stopped as it caused slight pain. A week later the patient was discharged. The wrist was reduced 2 in., and was only half an inch more than the normal one. The remaining swelling was firm and hard. Flexion of the wrist was almost complete, rotation free, and extension slightly limited. A few days later the patient passed from observation, being able to flex the hands and wrists perfectly.

Bier says passive congestion has never failed him in cases of gonorrhœal joint inflammation, and the results, as regards rapid and complete cure and restoration of function, are brilliant as compared with what he has previously seen.

His teacher, von Esmarch of Kiel, habitually used plaster of Paris bandages, which, although they were removed as soon as the condition permitted, left the patient with a joint almost or altogether ankylosed.

The treatment does not apply at present to hydrops of the knee, but it was distinctly beneficial in acute articular rheumatism in the ten cases treated. The bandage is contra-indicated when there is tenderness of the nerve trunks, or when pain is distributed throughout the limb.

Bier has been extending his treatment to severe cases of osteomyelitis. His procedure in cases in which the joint is involved and the epiphysis has separated, is as follows:—

When pus is proved to be present, the abscess is punctured with a thick trocar and flushed with normal saline solution, or opened by making several small incisions. The bone is not to be exposed widely, for fear of favouring necrosis. No packing is put in the wound, for fear of drying up the bone. The whole limb is loosely covered with thick absorbent material.

The results of fourteen well-marked cases were as follows:—

Recovery without necrosis, six; recovery with slight necrosis, five: recovery with extensive necrosis, two; death from pyæmia, one.

Among the conditions which Bier has successfully treated with the congestion bandage are whitlow, recently infected wounds, carbuncles, boils, lymphangitis, erysipelas, and acute itching eczema. Also conditions not of bacterial origin, as mosquito bites and acute attacks of gout. He does not consider his experience of erysipelas sufficient to base any conclusion on, as he himself has had but thirteen cases; these came in an epidemic. The treatment was the same as in other conditions—the bandage was applied round the neck, and œdema, etc., produced, just as for cellulitis. The duration of the cases was from four to nine days, which he thinks rather better than the average: and the constitutional symptoms subsided when the bandage was applied. In other hands, however, cases of erysipelas have not done so well.

Another considerable field for congestive measures is middle ear disease, whether acute or chronic, complicated or uncomplicated. When the tympanum has not ruptured, if it bulges outwards or is discoloured, paracentesis should be performed. When the mastoid is involved, an incision is only to be made if it is certain that pus will be found. Bier records one post-influenzal case in which the treatment was not successful.

The available evidence leads one to the conclusion that the congestive treatment almost instantly stops the toxic poisoning: that it relieves the patient of pain in almost every case; that it often prevents, and always limits, gangrene and sloughing; and that when skilfully applied the pathological vascular engorgement of the part tends to subside. Bier throws out the suggestion that passive congestion may possibly be less inimical to streptococcal infection than to staphylococcal or gonococcal.

Of patients who have died under treatment the post-mortem examination has usually revealed some cause of death independent of the condition being treated, although there is a reasonable possibility of a clot forming where the bandage is applied, and an embolus, septic or otherwise, being dislodged.

This dissertation would be very incomplete if I did not refer a little more fully to the cupping-glass and suction apparatus. These were used and discarded by Bier, but they were subsequently taken up by his colleague Klapp, who perfected the technique, and now they bid fair to rival the congestive bandage.

The cupping-glass is particularly suitable for incipient boils, carbuncles, whitlows, etc. The glass has two orifices, the larger of which is applied to the patient's skin, while the other communicates with an indiarubber ball, by which the air is withdrawn from the cup when applied. The slight rarefaction of the air thus obtained is sufficient to allow the cupping-glass to adhere, and just the amount required to draw the boil without causing pain. It is applied for five minutes, then taken off for three minutes. This is repeated until it has been applied for forty-five minutes each day. Care must be taken to grease the skin surrounding the inflammation, to avoid infection of the hair follicles. The grease is cleaned off with benzine. Again the production of pain indicates faulty technique.

For whitlow there is a special finger cupping-glass, fitting accurately round the base of the phalanx by means of an indiarubber finger-stall with the end cut off.

The larger suction apparatus is designed for mastitis—puerperal or otherwise. A large receiver, which fits the thorax just outside the mamma, is applied and exhausted. Abscesses having been opened by small incisions to let out the pus, the whole fluid contents of the mamma are sucked into the receiver. The application is for the same length of time as mentioned above for the cupping-glass. The ordinary breast-pump may be applied in an interval, and between times the mammæ are wrapped in antiseptic dressings.

Bier claims that the suction treatment of mastitis fulfils all the requirements of an ideal treatment. It sucks off the pus and milk, and renders the mamma hyperæmic in a very effectual manner. It soothes the pain and suppresses the infection, softens and absorbs old nodules, so that there is subsequently hardly any appreciable interference with the function of the gland.

Many other designs of cupping-glass and suction apparatus have been devised for special conditions.

The unanimous verdict of the Surgical Congress held at Berlin in the spring of 1906 was, that Bier's treatment fully justified its claim in relieving pain, reducing the temperature to normal, and subsequently restoring the function of the affected part. The disadvantage of the system was found to be in the incessant observation, which made it only suitable for hospital practice.

THE BLOOD IN RHEUMATOID ARTHRITIS.

By H. H. Bullmore, M.B., Ch.B., M.R.C.P.Ed., and Rupert Waterhouse, M.D.(Lond.), L.R.C.P., *Honorary Assistant Physician and Pathologist to the Royal United Hospital, Bath.*

It has long been recognised that many sufferers from rheumatoid arthritis are anæmic, but observations which have been published concerning the character of the blood in this disorder are comparatively few in number and meagre in detail. Sir Alfred Garrod,[1] writing in 1876 on the condition of the blood in this disease, says: "The clot has exhibited a healthy appearance, only a slight buff from excess of fibrin in the acute forms. The serum has been of normal specific gravity, and has not shown the presence of urate of soda or uric acid."

Bannatyne,[2] twenty years later, remarks that "there is a slight but well-marked diminution in the number of the red blood corpuscles (4,300,000 to 3,000,000); a marked and greater diminution in the hæmoglobin (80 to 40 per cent.), and a slight increase in the number of the white corpuscles." He also mentions that Forsbrooke[3] states that in all cases he found anæmia either in an early or in a later stage, the number of red blood corpuscles averaging between 75 and 52 per cent. Lane[4] also mentions that anæmia is one of the most constant symptoms, but that it has not the appearance of an idiopathic anæmia, and that it never assumes a chlorotic form.

Many other writers mention anæmia as being a frequent concomitant of the disease, but do not give details as to its characters.

Up to the present we have examined the blood in forty-two cases of this disease. The method adopted was as follows:—The blood was taken at the same time each day, namely, 10 to 10.30 A.M., from hospital patients who breakfast at 8 A.M. Hæmoglobin estimations were made by Haldane's method. In enumeration of the red blood cells the Thoma-Zeiss hæmacytometer was used, dilution 1 : 200. Two separate counts of eighty squares each were made. If the disparity in the results when worked out was less than 250,000, the average of the two was recorded; if more than that number, a third drop was taken, and eighty cells counted and the average of the three enumerations was recorded. The same method (dilution, 1 : 20) was adopted for the white cells, but the average was taken of three counts of the whole 400 squares. One thousand white blood cells at least were counted in all the differential counts. Jenner's and Leishmann's stains were used for working purposes, and Ehrlich's tri-acid stain as a control.

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[1] "Treatise on Gout and Rheumatic Gout," London, 1876.

[2] *Lancet*, London, 1896, vol. ii. pp. 1–10.

[3] "Dissertation on Osteo-Arthritis."

[4] "Rheumatic Diseases—so-called."

The results obtained were as follows:—In only one case was the percentage of hæmoglobin 100. This was a well-marked case of spondylitis deformans, and it is questionable whether it should have been included in this series. None of the joints of the extremities showed any typical rheumatoid change, but only some restriction of movement and stiffness. However, as it is usual now to class this complaint with rheumatoid arthritis, we have included it. There was no history of gonorrhœa or syphilis. In eight instances the hæmoglobin was between 90 and 100 per cent.; in twelve, between 80 and 90; in eleven, between 70 and 80; in four, between 60 and 70; and in one, below 70 (namely, 30 per cent.). In this latter case, a woman, æt. 38, a typical example of the fusiform type of the disease, the intense greenish pallor resembled that of a severe case of chlorosis. There was a history of hæmatemesis five years previously. Great and rapid improvement of the general health followed the administration of drachm doses of syrup of the iodide of iron in conjunction with hydrotherapeutic measures.

The number of red blood cells was below 5,000,000 in all but nine cases. In twenty cases they numbered between 4,000,000 and 5,000,000; in ten, between 3,000,000 and 4,000,000; and in one case (that just referred to), only 2,890,000. The microscopical appearances of the red blood corpuscles were those of a secondary anæmia of greater or lesser amount, and in all cases went hand in hand with what would be expected from the degree of anæmia as evidenced by the count. The colour index was normal or slightly greater in no less than ten instances: in all these the number of red blood cells was below normal. In one case the colour index was 0·52; in one, 0·68: in the remainder, it was between 0·72 and 0·96.

The constancy shown in the numbers of the white blood corpuscles is noteworthy. In all but six instances they were between 5000 and 10,000 per c.mm., and the greatest number counted per c.mm. was 13,400. In the five instances in which the numbers were greater than normal, no suppuration or inflammatory complication could be detected to account for the increase, the cases were not specially acute, nor was the anaemia specially severe. In one case they numbered less than 5000 (=4800). The differential counts of the leucocytes do not call for special mention. Except in one case, where the number of finely granular eosinophiles (47·05 per cent.) and lymphocytes (45·17 per cent.) were practically equal, the proportions of the different varieties were within the limits of physiological variation: in only three cases were myelocytes present, and then only in very small numbers (0·6, 0·3, and 0·2 per cent.).

Of the patients examined, thirteen were males, twenty-nine females; one was æt. 17, eight were between 20 and 30, sixteen between 30 and 40, nine between 40 and 50, and eight between 50 and 60: all, with the exception of the case of spondylitis deformans, were examples of the polyarticular form of rheumatoid arthritis. In some the onset had been acute; in others, subacute; in others, quite insidious. Some had recurring subacute febrile attacks, some an evening rise of temperature, some were afebrile. The joints presented soft fusiform swellings, coarse or fine grating of the articular surfaces on one another, or greatly restricted movement from contraction of the periarticular structures with or without various distortions. All these conditions may be different stages of one process, and may not infrequently be found combined in the same individual.

All the cases were necessarily "chronic," in that the disease had been in progress for some considerable time: but in all there was evidence from the symptoms or physical signs, or both, that the disease was in an active phase.

Muscular wasting, increased myotatic irritability, increased pigmentation, localised sweatings, increased rapidity of the heart's action, and some enlargement of the lymphatic glands, were present in the majority. The patients were quite unselected as regards their appearance of bloodlessness. In this respect they vary greatly. Some present a striking pallor, suggesting a "blood state" or the anæmia that follows long-continued slight losses of blood. More commonly the facial aspect resembles that of septic absorption or of the debilitated or "run down." In some instances patients, even in severe and advanced cases, are ruddy and, as regards their facies, almost healthy looking. Cases were, however, picked so as to exclude as far as possible those that had any possible focus for septic absorption, such, for instance, as those complicated by otorrhœa, pyorrhœa alveolaris, uterine discharges, etc., or those in whom there was evidence or history of venereal disease.

Our results may be summarised as follows:—Anæmia is almost always present in rheumatoid arthritis. There is, as a rule, a slight diminution (to between 75 and 95 per cent.) in the number of the red blood corpuscles, and a slightly greater (to 70 to 90 per cent.) diminution in the amount of hæmoglobin. In the great majority of cases the leucocytes are not increased in number, and the normal proportions of the different varieties to one another are preserved. Myelocytes in small numbers are present in a few cases only.

Our thanks are due to the Honorary Medical Staff of the Royal Mineral Water Hospital, Bath, for their kindness in allowing us to make these examinations of the patients under their charge.

CLINICAL RECORDS.

A CASE OF CONTINUOUS MURMUR OVER THE PULMONARY AREA OF THE HEART.

By THEODORE FISHER, M.D., M.R.C.P., *Assistant Physician to the East London Hospital for Children.*

THE following brief notes being clinical only, do not furnish any definite support to the view held by Dr. G. A. Gibson, that a continuous murmur audible over the pulmonary area is diagnostic of a patent ductus arteriosus. When the case came under my notice, however, I had not read any communication of Dr. Gibson upon the subject of patent ductus arteriosus, neither was I aware that a continuous murmur had been described in connection with the opening of an aneurysm of the aorta into the pulmonary artery or superior vena cava. The case, therefore, possibly possesses any small element of value that may belong to a somewhat unusual case that is noted down just as it appears to the observer.

CASE 1.—In October 1899, a young married woman, æt. 25, was seen at the Bristol Hospital for Sick Children and Women. She suffered from some palpitation and dull aching pain over the cardiac area. Seven years before, she had been laid up with rheumatic fever. The history of rheumatism would lead to the expectation of finding signs of some ordinary valvular lesion; and a systolic murmur was audible at the apex, and widely beyond it, which was possibly a sequel of the rheumatic attack. Other more striking physical signs were, however, present. In the second left intercostal space was a marked thrill, which was very localised. It could not be felt in either the first or in the third interspace. Over the same situation was "a strange murmur," which the notes describe as "like a loud venous hum, continuous through systole and diastole, with a loud second sound audible in the middle." The "hum" is further stated to have been "undulating, waxing and waning with systole and diastole," and, like the thrill, "very localised, best heard about two inches to the left of the sternum, and scarcely audible at all over the space of the breadth of the mouthpiece of the stethoscope from the left border of the sternum."

Further inquiry showed that, although the patient had suffered from rheumatic fever, she had never been active. "Ever since she could recollect," she had been unable to run or join in the outdoor games of her schoolfellows. She had been told that she had turned blue at the age of 10 months, and on several occasions afterwards and during some period of childhood a doctor had told her mother that something was wrong with her heart. Five years after she first visited the hospital, she was again seen. During these years she had given birth to a fourth child, but the strain of pregnancy and of household work did not appear to have aggravated the symptoms of which she had formerly complained. The murmur had not altered. The only additional point observed was reduplication of the second sound over the pulmonary area, but this was probably a detail that should have been previously recorded.

Amongst my notes there is mention of another case, possibly of similar nature, but much more briefly referred to. The notes regarding the murmur are simply these :—

CASE 2.—"There is a widely audible systolic murmur, best heard in the first, second, and third left intercostal spaces, but much louder in the second space than elsewhere, where it is continuous through systole and diastole." A reduplicated second sound was audible in the middle of the murmur. This murmur occurred in a woman, æt. 36. She too, curiously enough, had suffered from rheumatism in late girlhood—at the age of 15 years. Her aspect was healthy, but said that she sometimes turned very blue. Apparently there had been nothing during childhood to direct attention to her heart. When seen, however, the cardiac symptoms were not severe—apparently nothing more than some palpitation on exertion.

It may be added that in neither of these cases was there any noteworthy displacement of the apex or increase of cardiac dulness.

In the notes of the second case there is the mention of a humming character in the murmur; but in a child, æt. about 9 years, under the care of a former colleague of mine, Dr. E. C. Williams, which I had an opportunity of examining, a loud continuous roaring murmur was audible. In this, as in the other cases, a loud and reduplicated second sound was heard in the middle of the murmur. The mixture of an undulating roar with a reduplicated second sound of sharp character reminded me of the noises to be heard in the engine-room of a screw-steamer. In the engine-room there is a roar which varies somewhat in intensity, and clicking sounds are audible, which in some degree resemble the accentuated and reduplicated second sound heard in the midst of the roaring murmur over the pulmonary area.

It is needless to say that a strong point in favour of Dr. Gibson's contention that a long continuous, or almost continuous, murmur audible over the pulmonary area in some cases is diagnostic of a patent ductus arteriosus, is that in other cases a similar murmur is heard where a communication has been established between an aneurysm of the aorta and the pulmonary artery. Several years ago Dr. Goodhart said that in no less than five cases he had been able to make a correct diagnosis of the condition from the presence of a "continuous bruit, in part occupying the systole, in part the diastole."[1] Since Dr. Goodhart published these remarks, several similar cases have been recorded. It is also interesting that in the same paper Dr. Goodhart quotes Dr. Hilton Fagge's description of a murmur heard in a case of patent ductus arteriosus. Dr. Fagge's description is as follows:—"The murmur was in part musical, was audible at the second left costal cartilage, and was transmitted to the left along the cartilage, but not downwards along the sternum. It had a wavy character, quite unlike anything I had heard before." In the localisation of a murmur of "wavy" character to the second left interspace, this murmur appears to have possessed features of resemblance to other murmurs which have been considered to be due to the presence of a patent ductus arteriosus. Dr. Fagge, however, thought that the murmur in his case was diastolic. Careful observer though Dr. Fagge was, he may have been partially mistaken. The word "wavy" which he uses is strongly suggestive of increase and decrease in intensity during systole and diastole. That the murmur was probably not accurately described as diastolic, is suggested by another remark of Dr. Goodhart's. He mentions that the murmur of patent ductus arteriosus was, at the time of his paper, described in text-books as being "harsh and humming, its time diastolic, *but difficult to gauge accurately, it is so long*";[2] and further adds that this description is mainly based upon the case of Dr. Hilton Fagge. I have not consulted Dr. Fagge's own article; but his remarks as quoted by Dr. Goodhart, and Dr. Goodhart's own summary of the characteristics of the murmur as he considered them to be represented by text-books, are interesting in view of the light thrown upon the question of the diagnosis of a patent ductus arteriosus by Dr. Gibson.

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[1] *Guy's Hosp. Rep.*, London, vol. xlvii. p. 108.

[2] The italics are mine.

NOTE.—Since writing the above, I have met with another well-marked case of continuous murmur over the pulmonary area. It is present in a boy, æt. 7 years. The murmur is loudest at the inner ends of the first and second left intercostal spaces, but is widely heard, being audible even behind. Yet, although widely conducted upwards and into the axilla, it is only faintly audible below the fourth rib. It is as clearly heard behind as over the apex. The murmur may be described as similar to a harsh venous hum audible through the whole cardiac cycle but louder during systole. When it is best heard it may be said to resemble such a sound as might be produced by a number of small shot rapidly travelling through a thin metal tube. The boy has been several times seen at a children's hospital by a well-known physician. I was shown out-patient letters on which were written several notes in which the murmur is frequently described, the words "continuous" and "all through cardiac cycle" being used to denote the time of its occurrence.

TWO INTERESTING NEOPLASMS OF THE UTERUS—(*a*) PROLIFEROUS CYSTIC DISEASE; (*b*) CHORION EPITHELIOMA.

By JAMES OLIVER, M.D., F.R.S., F.L.S., *Physician to the Hospital for Women, London.*

(*a*) PROLIFEROUS CYSTIC DISEASE OF THE UTERUS.

CASE I.—Betsy G., æt. 51, and married twenty-eight years, has had ten children and three miscarriages. The miscarriages occurred prior to the birth of the last child, and this was born eight years ago.

In March 1906 (the present date being January 1907), patient, having previously been quite regular and the menstrual discharge having been of the ordinary amount, began to lose blood from the genitals, and since its appearance this hæmorrhagic discharge has practically never ceased. For twelve months she has complained of backache and pain in the lower abdomen, but the pain has never been severe. There is no bladder nor rectal symptom.

Physical signs.—Palpation of the abdomen reveals nothing; but patient is very stout, her weight being about 15 stones. She is not especially anæmic.

Vaginal and bi-manual examination.—The cervix uteri, which is healthy, is flush with the vaginal roof. The body of the uterus is enlarged, the size being equal to that of a cocoa-nut. Towards the right fundus the consistence is somewhat soft, but elsewhere it is fairly firm.

As I considered the case one of a degenerating fibroid, I advised and performed panhysterectomy by the abdominal route. The patient recovered without an untoward symptom.

Fig. 1 represents fairly well the condition of affairs revealed when the uterus was laid open, and it requires but little supplementation. It is more than probable that before the operation the neoplasm was located entirely in the wall of the uterus, and that the compression exercised by the volsellum with which the fundus was grasped at the time of the operation caused the tumour to burst its confines and protrude into the cavity of the uterus. The tumour was a somewhat diffluent mass with numerous cysts, many of which were flaccid. The cysts varied in size from a millet seed to a grape, and although the greater number of these were attached at one end only to a stalk, yet some were attached at both poles. The larger cysts remained adherent to the wall of the irregular cavity in the uterine substance, and could not readily be dislodged therefrom. The tumour was not the product of a parasite. The basis substance was diffluent. Sections including a portion of the uterine wall revealed nothing which enabled me to arrive at any definite conclusion regarding the character of the growth. It is highly improbable that it was a product of conception.

(*b*) Chorion Epithelioma.

Case 2.—Mrs. P., æt. 45, and married twenty-six years, has had fourteen children and two miscarriages. The last child was born in 1904, and the last miscarriage, a three and a half months' pregnancy, occurred in July 1906. Three weeks after this miscarriage, patient was curetted in a small provincial hospital on account of persistent hæmorrhage from the uterus. As this curettage proved of no avail,—the hæmorrhage continuing as before,—she was sent to me by Dr. George Thomson of West Ealing. On 20th October—about three months after the miscarriage—I also curetted, and in doing so I remarked the existence of an extremely hard outgrowth located at the left fundus and projecting into the cavity of the uterus. As I failed, even with the sharp spoon, to make much impression upon this growth, on account of its gristly character, I endeavoured to detach it by means of a pair of polypus forceps. By these I merely obtained shreds of the growth, which were submitted to the pathologist for examination. From these shreds the pathologist was not prepared to express any definite opinion concerning the nature of the growth. After the second curettage the hæmorrhage ceased entirely. Whilst curetting I came to

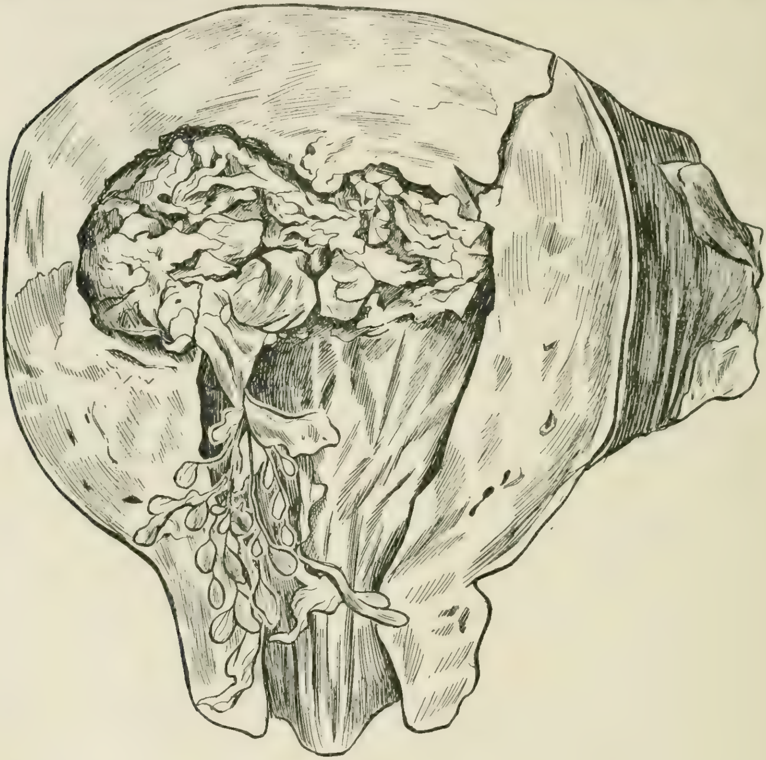

Fig. 1.

the conclusion that the growth was malignant, and on 19th November I performed the operation of panhysterectomy by the abdominal route. There was no evidence of secondary growth anywhere. The patient made an excellent recovery.

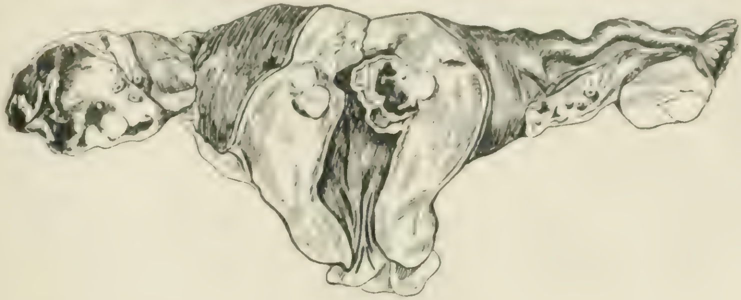

FIG. 2.

Fig. 2 displays the site of the growth as observed after the cavity of the uterus was exposed. Sections of the growth showed infiltration of the subjacent uterine wall with small round cells, amongst which were large masses of multi-nucleated protoplasm and large cells presenting the characteristics of decidual cells.

REVIEWS OF BRITISH AND FOREIGN LITERATURE

The Nursling. The Feeding and Hygiene of Premature and Full-term Infants. By PIERRE BUDIN, Professor of Obstetrics, University of Paris. Authorised Translation by WILLIAM J. MALONEY, M.B. London: The Caxton Publishing Company.

AMONG the men who shed lustre on the Paris medical school in the later years of the nineteenth century, Budin was one of the chief. His work in Paris, and the debt France owes to him, can scarcely be overestimated, and just now as his book "Le Nourrisson" appears in an English dress, not France only, but the whole medical world, laments his death. Here in Edinburgh we have so long been familiar with "Budin's method" of feeding infants (it was strongly advocated and to some extent popularised by the late Dr. Milne Murray) that it is a matter of wonder to us that his book has not before now been translated. Having waited so long, we had a right to expect a good translation, and at once we may say that this expectation is fulfilled in Dr. Maloney's volume, for seldom have we read a more faithful, accurate, and altogether charming rendering than comes from his pen.

"The Nursling" is written in the form of clinical lectures, and the subject-matter is dealt with entirely from a clinical standpoint. There are none of those metabolic investigations or tables of nitrogen and other balances (repellant, however valuable they be, to the average reader) which bulk so largely in some treatises. Here, all is simple and direct; rather wordy, and containing repetitions, as is natural from the style adopted, but the book is one which every practitioner and specialist will read with pleasure from cover to cover.

The first lecture deals with the prevention of chilling in weakly children, and shows very strikingly the enormous mortality among premature infants, when care is not taken to ensure a proper temperature. It is an interesting observation that immersion in a bath gradually warmed up to 100° has a much more prolonged effect on the body temperature than immersion for the same time in a bath uniformly maintained at this temperature. In the second lecture the feeding of weaklings is discussed, and particular attention is drawn to the occurrence of attacks of cyanosis in premature babies. This is due to underfeeding, and indicates a larger quantity of nourishment. Considerable space is given to the quantity of human milk required by feeble undersized infants, because when (as in Budin's practice) extensive use is made of wet-nursing, it is necessary to supervise this in a way which is not required when the mother suckles. Budin is able, from clinical observation, to lay down the rule that infants under 6 lbs. require a little more than one-fifth, and infants over that weight a little less than one-fifth, of the body weight daily. The subject of the premature child is concluded in the third and fourth lectures, which give the best detailed account of the management of wet-nursing we have read. The way in which a good nurse's supply of milk responds to the demands made on it is one of the most interesting things in the volume. The account given of the management of wards for infants is also full of useful hints.

The fifth to the ninth lectures are those to which most readers will turn with greatest interest, for in them Budin tells how he feeds full-time healthy infants. Now it should be clearly understood what Budin taught. It is generally loosely assumed that he dieted all infants indiscriminately on undiluted cow's milk. This, however, is scarcely accurate. While he advocated pure milk as alike the simplest and most suitable food, he qualifies his position thus (p. 130): "I carefully refrain from asserting that during the first month of life milk ought invariably to be prescribed unmixed with water . . . . infants may not tolerate cow's milk overcharged with butter or casein . . . . Again, infants may or may not be healthy, and in the latter case their digestive tube has need of judicious treatment . . . . and it may be of service to add . . . . water, barley-water, lime-water, or other diluent . . . . in infants who do not tolerate pure milk at the beginning, some form of digested milk may be of service." Budin's great service has been to show that complicated milk mixtures are not essential to success, and certainly the records and illustrative charts in which the book abounds are such as to strike the reader with envy. We thoroughly agree that, provided the infant digests it, no more satisfactory food than undiluted cow's milk can be given, yet our experience here is that failure attends its use in a comparatively large percentage of cases. Budin, on the other hand, comes to us with a practically unbroken record of success. Whence does the difference arise? The reason seems to be that Budin's patients were in most cases medically supervised from birth. He strenuously enforced breast-feeding if it could possibly be attained, failing this he by choice used a wet-nurse, and only if that were out of the question did he allow substitute-feeding. In any case the infants he had to treat were in most cases healthy, with undisturbed digestions. Under the conditions that exist in hospital practice here, the physician often sees infants only after half a dozen foods have been tried and found wanting, and only when more or less pronounced intestinal disturbance has been set up — he has to deal with sick, not with healthy children. Now in these, undiluted milk and everything else will often fail. We are certain, however, that Budin's work is along right lines. In the artificial feeding of children, prevention is better (and a hundred times easier) than cure, and he shows how, with a minimum of trouble, a healthy generation may be reared, despite artificial feeding. For the rest, the milk, though sterilised for three-quarters of an hour at 100° C., has not in his hands caused scurvy, and we agree that the risk (though it is greater than Budin admits) is almost negligible. Those who urge that cow's milk is unphysiological may be advised to study Van Slyke and Hart's recent work on the digestion of casein.

This is not referred to by Budin, but it seems to us to afford a clue to the remarkable way in which a fluid so unlike the milk of the woman is tolerated by many children.

Professor Budin's book will, we hope, be widely read in England. It should do much to disabuse the minds of the public (and we venture to add, of a section of the profession) of the idea that for the child deprived of its natural sustenance any better food can be procured than unsophisticated cow's milk.

A Text-Book of Ophthalmic Operations. By HAROLD GRIMSDALE and E. BREWERTON. London: Kegan Paul, Trench, Trübner, & Co.

CURIOUSLY enough, before the appearance of this book, no text-book on ophthalmic operations written in our own language existed. We therefore gladly welcome this new volume from the pen of two young London ophthalmic surgeons.

The general character of the book and the arrangement of the subject-matter are most satisfactory; but the illustrations are very roughly executed, and not in keeping with the high quality otherwise prevailing. On the whole, however, it is a work of importance, and will be a valuable asset to every practising ophthalmic surgeon, for most of the operations performed at the present day are fully and lucidly described. The only faults we find in the book are those which come under the heading of sins of omission, not commission. The most important example of this nature is the entire absence throughout the work of any reference to the disinfection of instruments and dressings, the preparation of the patient and of the field of operation, and the comparative merits of so-called antisepsis and asepsis. Such important omissions greatly mar the usefulness of a work on operations presumably intended for the living subject, and not for the cadaver.

The first and second chapters deal with operations on the extrinsic muscles of the eyeball for the correction of strabismus, and on the eyelid muscles for the improvement of ptosis. A general outline of the anatomical relations of the parts concerned and of the orbital aponeurosis very properly begins the chapters, but the functions of the check ligaments after tenotomy and advancement are not referred to, although these altered functions lie at the bottom of a successful issue in the surgical treatment of these deformities.

Chapters iii. and iv., dealing with operations on the lids, are carefully written, and the various operations fully described, with the exception of Arlt's operation for entropion, which is badly described and indifferently illustrated. It would be impossible to get the desired bridge containing the hair bulbs if the first or vertical incision were made only 4 mm. deep, and the horizontal incision 5 mm. from the lid margin.

In chapter v. enucleation and its substitutes are fully dealt with. We are, however, surprised to hear that enucleation can be performed almost without risk, no mention being made of the dangers of cardiac syncope from division of the optic nerve.

Operations on the lachrymal apparatus and bones of the orbit receive careful treatment in the sixth chapter.

Chapters vii. and viii. deal with cataract and so-called after-cataract. Preliminary iridectomy, which is favoured by the writers, is quite unnecessary, for it subjects the patient to two operations and often a third one, dilaceration, is necessary. In cautioning the operator to see that the edge of the knife is turned upwards before making the incision in cataract extraction, the following amusing statement is made :—"It is always easy to tell the back of the knife by the maker's name on the handle." Surely one who presumes to perform a cataract extraction should have sufficient visual acuity to detect the back from the edge of the knife without such aid. Furthermore, asepticians do not permit such embellishments as the maker's name on the handles of instruments, for very obvious reasons.

The operative treatment of glaucoma is fully and thoroughly discussed in chapter ix., but we do not see any necessity for a dissertation on the theories of this disease in a book of this character.

The last chapter is devoted to some operations on the cornea, sclerotic, and iris; while a useful index completes the work.

We have great pleasure in recommending the book as a safe guide to an important branch of ophthalmic practice.

A Manual and Atlas of Orthopedic Surgery. By JAMES K. YOUNG, M.D., Professor of Orthopedic Surgery, Philadelphia Polyclinic. London: Rebman Ltd.

THIS volume may claim to rank with the more important among the large illustrated works on medical subjects published in such profusion by American authors during the last few years. The author states in his preface that the work is the result of an experience of twenty years devoted to the study of this subject in the dispensaries and wards of the large hospitals of Philadelphia and elsewhere. During its preparation every available treatise upon the subject has been consulted, and the chief object in view has been to include everything within the scope of orthopedic surgery, without encroaching upon the field of general surgery or of any of the specialties.

The illustrations, as might be inferred from the title of the work, are a very important feature. In addition to the local museums, which have been largely drawn upon, the author acknowledges his indebtedness to men in all parts of the world who have lent photographs.

The introductory chapter treats of the history of orthopedic surgery; there then follows a chapter on the general etiology and pathology of deformity, which includes an account of the etiology, pathology, and treatment of tuberculous joint disease. Under the general symptoms of deformity, the author refers to the disadvantages of deformity to the individual, and quotes Shakespeare's well-known lines describing the mental suffering of the Duke of Gloucester; but, as showing that a deformed body does not necessarily interfere with greatness of intellect or achievement of great deeds, he quotes Æsop, Alexander the Great, Socrates, Pope, Scott, Talleyrand, Byron, Lord Burleigh, Mendelssohn (and he might have included the German Emperor) as among the great men of the world who have been deformed.

The chapter on prophylaxis and general treatment is a very instructive one, the manipulation methods being very well illustrated by a series of excellent photographs, and the various forms of apparatus graphically described; the operative procedures, including tenotomy, osteotomy, and resections are described in detail, but in the division of shortened tendons the author does not seem to lay such stress on the method of division whereby the tendon is lengthened as this would seem to deserve.

Part II., which deals with special orthopedic surgery, commences with a chapter on "Pott's Disease of the Spine," which is very completely illustrated; some of the skiagraphs of the vertebræ, however, cannot be described as successful, although we grant the difficulty of the subject. Non-tuberculous diseases of the spine include an extraordinary jumble of different conditions, beginning with kyphosis and round shoulders, and going on to scorbutic spondylitis, typhoid spine, syphilis of the spine, and infective conditions. The following chapters deal with sacro-iliac disease, hip-joint disease, non-tuberculous disease of the hip, and it may be here remarked that the pathology of some of these leaves a great deal to be desired. Coxa vara is well described and illustrated. In the section dealing with disease of the knee-joint, the illustration of Thomas's knee splint is a very poor affair.

In most of the sections dealing with diseases of the joints, there is first a section on tuberculous disease, and then one on non-tuberculous disease; and in many instances, for example that of the wrist, there is no disease of the joint described, but a series of extra-articular affections, such as teno-synovitis, ganglion, and infectious osteo-myelitis.

The second half of the book deals with subjects which are generally recognised as coming within the scope of orthopedic surgery, and the first of these, lateral curvature of the spine, is very thoroughly dealt with, and most profusely and well illustrated; a good deal of attention is devoted to the prophylaxis of scoliosis, and to measures directed to securing a proper attitude in children attending school. The treatment by means of exercises is much elucidated by the excellent series of photographs.

As was to be expected in a work of this magnitude, the various forms of spinal paralysis receive ample attention, and the newer methods of operative treatment by transplantation of tendons and by arthrodesis are satisfactorily described.

The remaining sections of the work deal with torticollis, neuropathic affections of joints, rickety deformities, club-foot, and congenital dislocation of the hip.

In conclusion, it may be said that, while this work is a valuable addition to the literature of orthopedic surgery, and surpasses most others in the wealth and excellence of the illustrations, we do not at all admire the arrangement of its subject-matter, inasmuch as this does not appear in our opinion to be founded upon a proper pathological basis.

Practical Physiological Chemistry. By J. A. Milroy, M.A., M.D., and T. H. Milroy, M.D., B.Sc., F.R.S.E. Edinburgh: William Green & Sons.

The second edition of this well-known text-book required no great change in its material and arrangement, and remains substantially the same. It is a smaller and more compact volume than the original publication, and this reduction has been attained almost entirely by the omission of the interleaved blank pages which were so numerous in the first edition. It is now a much handier book for purposes of reference; for, although intended primarily as a guide to junior students, it contains far more material than can be required by them, and is really one of the most useful practical books on the subject in the English language.

The difficulty of preparing a manual solely for the needs of junior students is a great one: error must arise in giving either too much or too little. The authors in this edition have overcome the difficulty by placing within brackets the methods and tests more suitable for advanced workers.

Little alteration has been made in the text. There have been added, chiefly as footnotes, suggestions which will prove useful to any one conducting a class on the subject. The tests have in some cases been slightly modified in the direction of giving greater certainty of a successful issue. All methods and tests are presented in a manner which show that they have been carefully rehearsed and are the outcome of much experience.

The book is one which well merits the success and popularity it has attained.

Poisons: their Effects and Detection. By A. WYNTER BLYTH and MEREDITH WYNTER BLYTH. Fourth Edition. London: C. Griffin & Co. Ltd.

THE excellence of this book has for many years made it indispensable to all whose work carries them within the domain of toxicology. This is due chiefly to the accuracy and reliability of the processes described and recommended for the separation of toxic substances, and to the careful manner with which successive editions have kept pace with the constant advances which have been made in our knowledge of various poisons. This holds good more especially in respect of the chemical parts of the work, but can scarcely be said to apply to the descriptions of the post-mortem appearances and pathological effects produced in the case of many poisons. The space devoted to the description of appearances found in specimens contained in the museums of London, it seems to us, would be much better utilised by giving an account of the post-mortem findings recorded during later years by careful observers. The post-mortem appearances in connection with arsenic and antimony are examples of what we refer to. While, as we have stated, the book is well up to date as regards all strictly chemical subjects, we cannot accept the chapter dealing with the examination of blood stains as providing us with the latest information on this subject. Recent researches of great value are not mentioned, and in the short reference to the biological test for human blood, it is strange to find the names of Jules Ogier and Herscher mentioned, and not one word of those to whom the credit belongs for giving us this most valuable addition to forensic medicine.

A few printer's errors are to be found, such as, on p. 332, 10 instead of 20 years, in referring to the statistics of strychnine poisoning; and on p. 335 in the footnote, $\frac{1}{3}$ gr. instead of 3 grs.; but, on the whole, the volume is one which reflects the greatest credit upon the authors.

Selected Essays—Syphilis and Small-pox. New Sydenham Society.
London: H. K. Lewis.

The New Sydenham Society has laid the medical profession under a fresh debt of gratitude by collecting in convenient form these essays on such important subjects.

The first series—upon syphilis—is composed of translations of all the papers by Schaudinn and Hoffmann, in which these authors first described the *Spirochætæ pallida* and *refringens*, the former of which they believed to be the cause of syphilis. These are followed by an abstract of Shennan's paper in the *Lancet*, in which he gives extracts from and references to all the available literature which was published up to the middle of January 1906. Castellani's observations on the occurrence of spirochætes in yaws is next referred to, and then follow the four communications by Metchnikoff and Roux, on the experimental transmissibility of syphilis to monkeys, in which so many important points were established.

The papers by Schaudinn and Hoffmann are reprinted in full, as is only meet and proper. In them can be traced the gradual increase of certainty—earlier probably in the case of Hoffmann than in that of Schaudinn—with which these authors came to regard the validity of their conclusions, and the satisfaction which they experienced as confirmation of their observations came from all parts of the world. At the present time the *Spirochæta pallida* is almost universally accepted on the Continent as the veritable cause of syphilis.

The *Spirochæta pallida* is fully described as it occurs in primary and secondary manifestations, including indurated buboes, and the methods of making films, and the best stains to use for its identification are detailed.

The papers containing the results of the experimental investigations by Metchnikoff and Roux are apparently reprinted in full. All except the last of these were published before the date of Schaudinn's discovery, but in them is demonstrated clearly the transmissibility of syphilis to several species of monkeys, though most of them fail to develop secondary manifestations.

In the fourth communication the authors report the discovery in the experimental lesions of spirochætes identical with those found in the lesions in man from which the virus for inoculation was derived. One of the important divisions of this paper is that in which are discussed attempts at the preventive treatment of experimental syphilis.

The second part of the volume comprises selected essays on the Pathology and on the Etiology of Variola and Vaccinia.

The Uses of Röntgen Rays in General Practice. By R. Higham Cooper, L.S.A. London: Baillière, Tindall, & Cox.

This is an admirably-got-up little book of just 90 pages. It is a genuine pleasure to read such a practical volume from cover to cover, and to find it so well written, excellently illustrated, and in most respects amply sufficient for the purposes which the author has in view. The writer tells just exactly what a tyro wants to know about the Röntgen rays, the focus tubes, radiograms, and the risks to operator and patient, and how these risks may be avoided. The merit of stereoscopic pictures in the localisation of needles, bullets, etc., is strongly urged, and a short summary of diseases is given, in the diagnosis and treatment of which the X rays may be used with benefit. Ten pages of additional matter devoted to apparatus would have been an advantage, because it is the outfit that worries the medical man, and it is in the getting of that outfit that many pounds may be misspent if not altogether wasted.

High Frequency Currents: their Production, Physical Properties, Physiological Effects, and Therapeutic Uses. By H. EVELYN CROOK, M.D. London: Baillière, Tindall, & Cox.

IT is very difficult to appraise the merits of this book. It is hardly the book for a beginner, inasmuch as it takes a great deal for granted; and yet for the reader who is not unfamiliar with electrical matters it will convey a good idea of the subject under discussion. We note, however, that the author does not describe the step-up transformer in referring to apparatus. A good account is given of the theories and facts with regard to the physical properties and physiological effects of high frequency currents, but the same commendation cannot be applied to the statement of the therapeutic uses of these currents. It is true that the whole subject is yet in its infancy, still it is desirable to offer something more than a record of isolated cases when giving in detail the diseases which should be treated by one or other method of application of the currents. Even where inexperience renders it impossible to be too dogmatic, the reader wants a definite plan of procedure and an exact and detailed account of how to apply the high frequency currents to his patients. The book has much in it which is worthy of praise, and, notwithstanding these criticisms, we feel that it will repay the reader if he is already possessed of an elementary knowledge of electricity.

Portfolio of Dermochromes. By Professor JACOBI of Freiburg im Breisgau. English adaptation of Text by J. J. PRINGLE, M.B., F.R.C.P., Physician to the Department for Diseases of the Skin at the Middlesex Hospital, London. Supplement. Rebman: London and New York.

THREE years since, Professor Jacobi published his Atlas of Dermochromes, the illustrations in which by their vivid reproduction of diseased conditions of the skin were at once recognised as conveying most lifelike impressions, and we took occasion at that time to endorse their educative value. Though the plates numbered no fewer than one hundred and fifty-seven, and embraced many varieties of cutaneous troubles, as well as numerous examples of syphilitic eruptions, there were unavoidable lacunæ, and to fill in those the present supplement has been brought out at the request of professional friends. It contains seventy-eight new dermochromes, a proportion of which depict syphilitic manifestations, which it is most important to be able readily to distinguish in themselves, but also to discriminate from simpler ailments. Drawn as the originals are from different sources, perfect uniformity in quality and excellence is scarcely to be expected, but taken all in all the pictures leave little room for adverse criticism. There are perhaps one or two which might with advantage have been given on a larger scale, but there is only one which wholly fails to convey an idea, even to the educated eye, of the disease which is meant to be portrayed. No one could identify Darier's disease from Plate VIII. Though so labelled, it might easily pass for lichen planus, but it does not convey the faintest conception of psorospermosis follicularis vegetans. If this complaint is as common as both author and translator seem to regard it, there should have been no difficulty in finding a typical example. As a contrast to this, nothing could be more admirable than the way in which the translucency of the vesicles in herpes progenitalis is reproduced, nor more true to nature than the figure of aphthæ on the lips with respect to which the valuable observation is made, "Patients who have previously suffered from syphilis have a great tendency to regard aphthæ as recurrences of their syphilitic trouble, and are often accordingly greatly distressed by them." The letterpress—which is more indicatory than didactic—has been well rendered by Dr. Pringle. The possessors of these volumes will find them of great assistance in identifying skin diseases, provided they will saturate their mental eye by careful, prolonged, and repeated study.

Clinical Lectures on Enlargement of the Prostate, with a Description of the Author's Operation of Total Enucleation of the Organ. By P. J. Freyer, M.A., M.D., M.Ch. Third Edition. London: Baillière, Tindall, & Cox.

Mr. Freyer states in this work that he has now performed the operation of total enucleation of the adenomatous prostate in 312 cases, with 22 deaths, the other 290 cases being successful. "When I speak of success, I mean complete success, the patients regaining the power of retaining and passing urine naturally, without the aid of the catheter, as well as they ever did. There are no half measures about this operation. The patient can be assured beforehand that if he is prepared to accept the comparatively small risk attaching thereto, he can, with absolute certainty, look forward to a complete cure," and so on. Such a statement is opposed to fact. Mr. Freyer may give such an assurance, but not all of his patients who have been "complete successes" are in the fortunate condition he thus glowingly describes. Mr. Freyer has done much for the alleviation of those who suffer from enlarged prostate, but he claims too much.

This work has the faults of all of his writings; the *ego*, and the detraction of others who have worked in this branch of surgery, both being too prominent. We still have the distinguished patients, and the onlookers at the operations are as numerous as ever, while the diagrams of prostates occupy, perhaps, even more space than formerly. It is surely time for this surgeon to sink self just a little, and be content with the gratitude the profession is only too anxious to give.

With a record in prostatectomy which no one can equal, the author had a splendid opportunity to write a valuable monograph. We close the book, after a careful perusal of its contents, bitterly disappointed that he has egregiously failed to avail himself of his great opportunity.

Atlas and Text-Book of Human Anatomy. By Dr. JOHANNES SOBOTTA. Edited by J. PLAYFAIR M'MURRICH. Volume I. "Bones, Ligaments, Joints, and Muscles." Philadelphia: W. B. Saunders Company.

THE power of visual imagery is of extreme value to the student of anatomy. It can only be acquired perfectly by dissection by the student himself, but next to this a good atlas, in which individual pictures are not too crowded, supplies the means of forming a mental picture. To practitioners such an atlas is most useful, as it constitutes an easy and rapid way of stimulating memory. Professor M'Murrich has edited the "Atlas and Text-book of Human Anatomy" by Professor Sobotta of Würzburg, and thus brought it within reach of the English and American medical profession. By doing so he has conferred a great boon on English-speaking students, as this work is excellently adapted for the study of the subject.

The first volume, which is before us, consists of the bones, ligaments, joints, and muscles. The text is concise, not too laden with detail, and the plates are beautifully done and extremely clear. These have their groundwork in photography and are most accurate, while no effort has been spared to maintain simplicity. The part devoted to the ligaments is particularly worthy of mention, but the whole volume reaches a high standard. We consider this a most valuable work, and believe it will be highly appreciated by the profession.

Dental Materia Medica. By E. H. LONG, M.D., Professor of Materia Medica and Therapeutics, University of Buffalo. London: Hodder & Stoughton.

THIS is the second edition of this work, and the author states in the preface that it has been carefully revised. Parts of the book must have escaped this careful revision. Take, for example, a paragraph from the chapter dealing with mercuric chloride as an antiseptic: "This powerful drug will seldom be the antiseptic of first choice in mouthwash. As a tooth disinfectant, it is seldom used because of the dental practice. Its unpleasant metallic taste prevents its use as a danger of staining the tooth through the formation of sulphide of mercury" (p. 138). The literary standard of medical writing in this country may not be high, but it has not yet fallen to this level. The work is quaintly illustrated by a number of diagrams of the central nervous system and principal viscera, in which the parts stimulated by a drug are coloured red and those depressed are blue. We cannot anticipate any great demand for the book on this side of the Atlantic.

Text-Book of Pharmacology and Therapeutics. By A. R. CUSHNY, M.A., M.D. Fourth Edition. London: Rebman Ltd.

THE fourth edition of Cushny's well-known text-book fully maintains the high standard set in previous editions. The fact that in the short space of seven years three large editions have been exhausted proves that the work has met with general acceptance. The plan of the arrangement of the present edition follows that which has been found useful in the former issues. The immediate cause of the present reissue was necessitated by the recent revision of the United States Pharmacopœia, but in addition to these changes, which do not interest British readers, the advances made in pharmacology and therapeutics during the past two years have been incorporated. It is interesting to note that Cushny does not believe that the subarachnoid application of drugs will continue to hold its own as a means of inducing anæsthesia. One of the strong features of Cushny's work has been the accurate references to the literature of the subject. It has been found necessary in this edition to curtail the references somewhat by the omission of some of the older references. It does not seem that any very great alteration in the presentation of the subject-matter has been made, though throughout the book there is evidence that the matter has been subjected to a careful revision. In describing the action of chloroform, the author adopts Embley's view that there may be early arrest of the heart from stimulation of the inhibitory mechanism. In the heart weakened by chloroform the inhibitory centre may be so irritated that in exceptional cases it may cause stoppage of the cardiac action, which may explain the sudden fatal collapse which sometimes occurs in the early stages of anæthesia. The therapeutic side of the work is gradually becoming more developed with successive issues, and thus what was formerly a weak spot has been removed. We can confidently recommend this edition as representing the present position of scientific pharmacology.

NOTES ON BOOKS.

THE second, third, and fourth volume of the 16th series of *International Clinics* (J. B. Lippincott Co., Philadelphia and London) contain, as usual, articles covering almost the whole field of medicine and surgery. A number of the contributions are of quite outstanding value, and nearly all are both readable and interesting, and contain information of a practical nature. In volume ii., Dr. Ballantyne discusses "Fœtal Hydrocephalus as a Cause of Delay in Labour," and describes the method of treating it by tapping through the spinal canal. The surgical papers are conspicuously strong; we may specially refer to that on "The Treatment of Fractures of the Arm," by Dr. Ross, who continues the subject of fractures of the leg in the fourth volume of the series.

In volume iii. there is an interesting paper by Sangery in the section devoted to therapeutics, giving Fournier's latest modification of the mercurial treatment of syphilis. In this volume, too, Dr. Harvey Pirie's account of life in the Antarctic relieves the severity of an otherwise exclusively technical volume. There is also a valuable lecture by Banti on "Leukæmia and Sarcomatosis."

Volume iv. opens with a good practical description of the present position of electro-therapeutics, from the pen of Dr. Rhein, the essential points being given within reasonable compass. Dr. De Lee contributes a detailed account of his method of treating placenta prævia. Space prevents us from mentioning all the articles in the three volumes; the nature and scope of International Clinics, however, are so well known that it is enough to say that the 16th series keeps the high level of its predecessors, which, for the rest, it in all respects resembles.

Dr. L. Ruhmeyer's monograph, *Ueber die Geographische Verbreitung und die Diagnose des Ulcus Ventricule Rotundum* (J. F. Bergmann, Wiesbaden), is for the most part a careful study of the geographical distribution of gastric ulcer in the Swiss cantons, with comparative data as to its frequency in other countries. The author has evidently devoted much attention to the subject, and has also investigated systematically in a large series of cases the gastric acidity, the tenderness, as measured by the algesimeter, and the presence or absence of occult hæmorrhages. The work does not, perhaps, advance our knowledge to a degree commensurate with the labour which it has entailed, but as a piece of accurate and thorough clinical observation it deserves the respect and attention of all interested in the subject of gastric ulcer.

This little volume—*Kimpton's Pocket Medical Formula*, by E. Quin Thornton, M.D. (Henry Kimpton, London)—is already in its seventh edition, a fact which speaks of its success. A special feature of this formulary is found in the indications and annotations as to the use of each formula. The quantities in each prescription are expressed in both the apothecaries' and metric system of weights and measures, and the book may well be of service to the student and the busy practitioner.

This, the seventh edition of Mr. Stanford Morton's monograph—*Refraction of the Eye* (H. K. Lewis, London)—has been revised and largely rewritten, and we have no hesitation in recommending it as a thoroughly sound and practical treatise. The short chapter on "Amblyopia and Malingering and its Detection" contains specially valuable advice.

Mr. C. B. Keetley has reprinted in pamphlet form, under the title *The Prevention of Cancer* (Baillière, Tindall, & Cox, London), some lectures delivered to the students of the West London Post-Graduate Course. Mr. Keetley, basing on the assumption that cancer is due to a micro-organism, proposes to prevent the disease by enforcing the ordinary laws of cleanliness, and employing familiar hygienic precautions on antiseptic lines. If the premisses are granted, it cannot be denied that Mr. Keetley presents his case with considerable plausibility, but we cannot say that his argument carries conviction, or that he has thrown any important new light on the subject.

Aseptic Methods, by Harold Upcott, F.R.C.S. (Baillière, Tindall, & Cox, London), embodies in simple language the elementary rules for the practice of modern aseptic surgery. It should prove useful to those to whom it is addressed—surgical nurses, especially in private surgical nursing homes, and dressers. Many of the lessons inculcated are, however, not to be learned by reading, but by constant practice.

The new edition—fourth—of *The Röntgen Rays in Medical Work*, by David Walsh, M.D. (Baillière, Tindall, & Cox, London), embodies all the recent work on this subject. The section on the electrical apparatus has been contributed by Dr. H. Lewis Jones, and the author has written the clinical portions. The applications of the X-rays to surgery, dental surgery, nasal and throat surgery, medicine, obstetrics and gynæcology, legal medicine, etc., are fully set forth. The illustrations are numerous, and are much clearer and more instructive than the majority of radiographic reproductions.

The author of this popular little treatise—*Aids to the Diagnosis and Treatment of Diseases of Children*, by John M'Caw, M.D., Third Edition (Baillière, Tindall, & Cox, London)—is to be congratulated that the necessity for the publication of another edition has so speedily arisen. The volume lays claim to be little more than a compilation, but the work is so carefully written and the various diseases are depicted in such a clear, practical, and concise manner, that it is bound to prove serviceable to the student.

A second edition of *Aids to Dental Surgery*, by Arthur S. Underwood, L.D.S., and Douglas Gabell, L.D.S. (Baillière, Tindall, & Cox, London), has been published in the "Students' Aid Series." A new chapter on the bacteriology of the mouth, and another on its hygiene, have been added. The technique of dental operative work is not touched upon, the aim being "to condense into a concise form" the theoretical part of the subject. Though, of course, too condensed and deficient in detail to be of use as a text book, the little volume should probably serve its less ambitious purpose of enabling a dental student rapidly to run over on the eve of an examination some of the main headings of his theoretical work.

This, one of the best text-books for students (*Text-Book of Pathology*, by Alfred Stengel, M.D., W. B. Saunders Company), has now reached its fifth edition. There has been considerable revision in the sections on General Pathology, and the book has been brought well up to date. The chapters on Inflammation and on Animal Parasites are specially to be commended. They give the essential points for students, are accurate, and do not open up too widely disputed fields. We very heartily commend Professor Stengel's book.

This is a work—*The Refraction of the Eye: a Manual for Students*, by G. Hartridge; fourteenth edition (J. & A. Churchill, London)—which has passed through fourteen editions in the comparatively short period of twenty-six years. Although there are many rivals in the field, especially in America, it is deservedly the most popular manual on refraction among students. In this new edition the original plan of the book has been maintained. It has been carefully revised and alterations made in accordance with our increasing knowledge of the subject. So far as it goes it is admirable, and we have much pleasure in recommending it to students who desire to possess a thoroughly reliable and readable guide to this important branch of ophthalmic practice.

Mr. Bland Sutton's work on *Tumours* (Cassell & Co. Ltd., London) has now become an indispensable work of reference, and this, the fourth edition, marks a still further advance on the preceding ones. A great deal of new matter and a large number of new illustrations have been added, representing a total of a hundred extra pages. The widespread interest manifested in cancer has induced the author to include an account of the prevailing opinions held by competent men in regard to this disease. Sections have been devoted to tumours of the ovary and of the testicle, and also a chapter on heterotopic teeth. We have nothing but admiration for the thoroughness with which this excellent work is kept up to date.

The Control of a Scourge, or How Cancer is curable, by Charles P. Childe, B.A., F.R.C.S., is one of the volumes of Messrs. Methuen's new Library of Medicine. The book is in no way morbid or sensational, and should it be widely circulated it may be productive of much good. It is a powerful plea for an early use of the knife, justified by the terrible paradox that while the lay press and the army of quacks are daily putting the public in possession of fresh "cures" which stand condemned on the face of them, they remain in ignorance of the only true cure, early recognition and early removal.

RECENT ADVANCES IN MEDICAL SCIENCE.

MEDICINE.

UNDER THE CHARGE OF

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Lumbar Puncture.

Judging from the number of papers which have recently appeared on the subject, lumbar puncture is coming more and more into use as a routine diagnostic and therapeutic method. Kampe (*Centralbl. f. d. Grenz. de Med. u. Chir.*, 1906, November 10 and 22, December 8) reviews its diagnostic and therapeutic value at length. Speaking of the technique, he remarks that while most physicians perform the operation by thrusting in the needle laterally, surgeons, as a rule, advise puncture on the middle line. The latter presents the advantage of being less likely to wound a vein. There is general agreement that only a few cubic centimetres should be withdrawn, and that the needle should be removed as soon as the pressure falls. There is a good deal of diversity of opinion as to the value of measuring the pressure; normally 125 mm. H_2O, it may rise to 700 mm. or even 1000 mm. Absence of pulsation, or the fact that only a very small quantity of fluid can be obtained, points to a block between the cranial and spinal cavity. The chemical examination of the fluid has not proved of much value. Phosphoric acid and cholin, in anything more than traces, indicate destruction of nerve elements. The value of the latter in distinguishing between organic and functional nervous diseases has been denied by several observers. Albumin to the extent of more than 0·5 grm. per litre is pathological, and has much the same significance as the presence of cells. Estimations of the specific gravity, and of the electrical resistance, and cryoscopy, are useless practically. The general tendency is to enumerate the cells exactly by using a leucocyte pipette as in an ordinary white count.

Special Diagnosis.—One of the chief uses of lumbar puncture is to diagnose all the forms of meningitis. *Serous meningitis.*—The fluid is clear, sterile, increased in quantity, and under slightly raised pressure it may show lymphocytes. *Purulent meningitis.*—The fluid is turbid or purulent, not excessive in amount, and the pressure is high. Among organisms which may be found in such cases (excluding the epidemic form) are pneumococci (in the majority of cases), staphylococci, and streptococci, *B. coli*, *B. influenzæ*, *B. lactis aerogenes*, *B. typhosus*. If the meningitis is circumscribed, the fluid may remain clear. *Tuberculous meningitis.*—The fluid is clear, or very slightly opalescent; a small clot forms on standing, which may contain the organism. The bacillus can be detected in from 25 to 100 per cent. of cases, especially towards the end of the illness. There is now less unanimity of opinion than formerly as to the importance of a lymphocytosis in the diagnosis. Polynuclear leucocytes are often found, without there being a mixed infection. Plasma cells (large basophiles with eccentric round nuclei) may also be found. *Epidemic meningitis.*—Every one now regards Weichselbaum's diplococcus as the cause of the disease. It is generally found early in the fluid, and may disappear later—by the fourteenth day. Still, it has been detected in the clear fluid after as long a period as ninety days. Sometimes the first puncture yields no organisms, and in fulminating cases they may also be missed. The number of organisms does not run parallel to the course; in very chronic and in very acute cases they are scanty. The fluid may be clear, cloudy, or purulent. It contains excess of albumin, and shows a polynuclear leucocytosis; in the later stages, along with improvement, there may be a lymphocytosis. *Hæmorrhagic meningitis.*—The fluid contains either fresh blood or dissolved hæmoglobin; otherwise it is not characteristic. In *sarcomatous meningitis* the fluid may be brown or yellow and contain tumour cells. *Syphilitic meningitis* yields a clear coagulable fluid containing lymphocytes. In *meningism* (the name which has been given to the meningeal symptoms which often complicate pneumonia, otitis media, etc., apparently without there being any anatomical change) the examination of the fluid is negative. This is, perhaps, one of the most important of the recent observations in connection with lumbar puncture.

In *chronic hydrocephalus* the fluid contains excess of albumin; its pressure is high. In *abscess of the brain* the fluid is clear, sterile, and under high pressure. [The difficulty of making an early diagnosis of the exact nature of a cerebral complication in otitis media is well known; abscess, purulent meningitis, or tuberculous meningitis may equally well be present. Kopetsky (*Am. Journ. Med. Sc.*, Phila., 1906, April) gives the following schedule, which may prove serviceable:—Normal fluid means sinus thrombosis, abscess, serous meningitis, meningism, and occasionally circumscribed meningitis; if the pressure is raised, the probability is in favour of the first three. A clear fluid with lymphocytes indicates tuberculous meningitis, and a turbid fluid which coagulates and contains polynuclear leucocytes, with organism, indicates purulent meningitis.] In *apoplexy*, puncture is dangerous on account of the liability to cause fresh hæmorrhage. The fluid is usually blood-stained from hæmorrhage into the ventricles, and contains albumin and cholin. In *cerebral tumour* we find increased pressure, clear fluid, cholin, and lymphocytes. Here, also, puncture should be cautiously performed, lest the withdrawal of much fluid cause hæmorrhage into the tumour. In hydatids the only abnormality is the possible detection of hooklets, etc. Lumbar puncture is of considerable value in mental diseases. There is a rise in pressure in all conditions of excitement, but, except in *general paralysis*, no lymphocytosis. In the last disease lymphocytosis is a most constant sign, being absent only during the periods of remission in a few patients. Phosphoric acid and cholin are also present. In *tabes*, lymphocytosis is the rule; it occurs very early, and is, therefore, a valuable sign in incipient and abortive cases. In Friedreich's ataxia the cerebro-spinal fluid is negative. In *poliomyelitis* the pressure is high, but no cells are present.

Lumbar puncture gives little information in disease outside the nervous system. The fact that it is normal in alcoholism and uræmia may sometimes prove significant. In syphilis, even without nervous symptoms, there is lymphocytosis.

Practically the only *contra-indication* to the performance of lumbar puncture is the suspicion of cerebral tumour, on account of the possibility of producing hæmorrhage into the tumour substance. It is also to be remembered that under no circumstances ought the pressure to be allowed to sink below 80 to 100 mm. H_2O.

The *therapeutic value* of the procedure is, unfortunately, limited. There is general agreement that it is beneficial in serous and syphilitic meningitis, and in the varieties of purulent meningitis which are not inevitably fatal—influenzal and typhoid, for instance. In pneumococcal and tuberculous meningitis it is of no value. In epidemic meningitis its use is doubtful; frequent tapping may prevent hydrocephalus, continuous drainage may be tried, or anti-serum, saline solution, lysol, etc., be injected. According to Altmann, injections of methylene-blue into the spinal canal reach the base of the brain. In hydrocephalus it should be frequently and systematically performed. The crises of tabes are said to have been ameliorated by puncture. Babinski has employed it with benefit in incontinence of urine; in this, as in other functional disorders, it is difficult to exclude the effect of suggestion.

In a paper entitled "Clinical Studies of the Cerebro-Spinal Fluid" (*Am. Journ. Med. Sc.*, Phila., 1907, April), Rous gives four determinations as of value—(1) pressure, (2) protein content, (3) cell content, and (4) cell characters. It is still a disputed point whether any lymphocytes are normally present, and the method commonly adopted for estimating their number in pathological conditions—namely, enumerating the number per oil immersion field of centrifuged deposit—allows of considerable personal error. Rous has devised the following technique:—Four decimal divisions of the usual red corpuscle pipette are filled with saturated solution of methyl violet, and the cerebro-spinal fluid is sucked up to fill the bulb. The cells can then be counted in the usual Zeiss chamber. Normally from 0 to 2 occur in each c.mm.; figures from 2 to 5 are doubtfully, and above 5 certainly, pathological. Two proteins are present,—serum albumin and serum globulin. The gross quantity may be estimated in a small-sized Esbach's tube. The pressure can most simply be estimated by connecting directly with the cannula a thick-walled glass tube with a bore of 1·5 mm. It is held vertically against a millimetre scale, the pressure read off as the height (normally 120 to 180 mm.) at which the cerebro-spinal fluid stands. Pulsation and respiratory waves should be visible; otherwise there is some technical error [or a block between cranium and spine].

Rous's cases fall into five groups—(1) Diseases other than nervous;

(2) nervous diseases showing no abnormality of the fluid; (3) tuberculous meningitis; (4) purulent meningitis; (5) cases other than tuberculous, and purulent meningitis showing abnormality of the cerebro-spinal fluid. In groups 1 and 2 the cells varied from 0·5 to 6·5 per c.mm., the average being 2·75. All were mononuclears, no polynuclears being encountered. The protein content was between ¼ and ½ grm. per litre, the average being ⅓ grm. Pressure was from 70 to 300 mm. H$_2$O, with the high average of 210. It was always estimated with the patient in the lateral recumbent position. 3. In all specimens of fluid from tuberculous meningitis the cells were much increased—from 43 to 686 per c.mm., the average being 213. From his own and the reported cases, Rous states that less than 100 per c.mm. is exceptional in this disease. The differential count brought out little except a tendency to lymphocytosis; there was no constant alteration in the proportions of cells as the disease progressed. The presence of polynuclears corresponds neither with the age, the stage of the disease, the anatomical lesion, nor the presence of secondary infection. The protein content was increased —from ½ grm. per litre to 10 grms. in one case. The pressure varied from 240 to 550, with an average of 365. 4. Purulent meningitis (including the epidemic form).—The pressure, protein content, and cell content were all high. Polynuclears predominated; their numbers varied from 1300 upwards. In cases which had a chronic course the fluid in the later stages was indistinguishable from that of tuberculous meningitis. 5. In three cases of *cerebral tumour* the pressure was high —380, 490, and 580 mm., but in only one was the fluid abnormal, containing 1 grm. of protein and 5·5 cells, of which 8 per cent. were polynuclear. One case of *uræmia* showed high pressure, without other change. A baby, æt. 9 months, with *acute otitis media*, showed high pressure and forty-seven polynuclears per c.mm. *Syphilitic affections* (hemiplegia, insanity, meningitis) all showed lymphocytosis, the numbers (36 to 64), however, falling short of what is got in tuberculous meningitis; the pressure was not raised. Two *hydrocephalic* children showed high pressure, but no abnormal cell content.

In many of the cellular fluids unclassifiable degenerated elements were found. These are thought to be due to autolytic digestion of the leucocytes, and Rous found that by incubating for four hours cerebrospinal fluid containing cells, he could increase the number of such structures. They appear as large, irregular, reticulated, basophile masses, with no trace of nucleus. The experiment seems to prove the correctness of the autolytic digestion theory.

Fankhauser (*Cor.-Bl. f. schweiz. Aerzte*, Basel, 1907, January 15) reports the findings in *mental disease*,—general paralysis, dementia præcox, epileptic insanity, imbecility, alcoholic insanity, senile psychoses, and post-apoplectic dementia. The points investigated were those referred to above. Fankhauser attaches little importance to the pressure (which can only be examined satisfactorily by the manometer), and none to the naked-eye appearance of the fluid. A rise was noted in the four imbeciles and in some of the general paralytics. The albumin content (measured by boiling with the addition of acetic acid) was much increased in all the cases of general paralysis, and slightly in about half of the remaining patients. The cellular elements were only increased in general paralysis. Counting was done in a special cell, larger than the ordinary Thoma Zeiss. Three kinds of cells were found: lymphocytes, polynuclears, and plasma cells. The last are large, with coarsely granular, usually vacuolated protoplasm, and eccentric round nuclei. Such cells are plentiful in the vessel walls of the pia, whence they escape into the cerebro-spinal fluid. It seems that lymphocytes may occur in the fluid of syphilitics, apart from disease of the nervous system. They are not, however, invariably found. The chief value of lumbar puncture in mental disease is to differentiate syphilis and paralysis from other maladies.

Ravaut discusses the effect of lumbar puncture on *cutaneous lesion* (*Presse méd.*, Paris, 1906, December 19). He has already recorded numerous instances of relief from pruriginous affections after the removal of 6 or 8 c.c. of fluid, and has therefore extended his observation to other skin diseases. He states that erythematous, secondary, and tertiary syphilides, lichen, eczema, psoriasis, and artificial dermatitis are often strikingly modified by lumbar puncture. It is chiefly cases in which there is much erythema that benefit, and Ravaut supposes that the good result is due to the action on the nervous system.

SURGERY.

UNDER THE CHARGE OF

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TUBERCULOSIS OF THE TESTIS IN THE INFANT.

Poissonnier (*Gaz. d. hôp.*, Paris, 1907, March 16) draws attention to the fact that when tuberculosis attacks the testicle in young children it is usually the body of the testis that suffers most, in contrast with what occurs in the adult when the primary incidence of the disease is on the epididymis.

Statistics show that tubercle of the testis is a comparatively rare affection in children, and that it usually appears before the age of 2. From that time till puberty it is extremely rare. As a rule, only one testis is affected, although cases are recorded in which the disease has been bilateral. Before the second year the two testes seem to be equally susceptible, while beyond that age the left is more frequently affected. Occasionally an imperfectly descended testis is the seat of tubercle. The condition is usually hereditary, and in some cases other tuberculous lesions, particularly tabes mesenterica and tuberculous peritonitis, are present. The infection may take place by way of the vas deferens, as in the adult, by the blood stream, or by way of the processus vaginalis, when the child is the subject of peritoneal tuberculosis. The morbid anatomy of the condition is the same as that in the adult, but the tunica vaginalis is usually more seriously involved, and the disease tends to infiltrate the peri-testicular tissue to a greater extent. The epididymis, the vas, and the seminal vesicles and prostate may become infected by direct spread of the disease. If the processus vaginalis remains patent, infection may spread by this route to the peritoneum.

In a certain number of cases the affection comes on acutely, the testis suddenly becoming swollen and tender, and the scrotum red and painful. In the course of a few days the acute inflammatory symptoms subside, but the testis remains enlarged, bossy, and adherent to the scrotum, and eventually sinuses form, and the organ is destroyed by the tuberculous disease. As a rule, however, the disease runs a chronic course, similar to that met with in adults. In exceptional cases, the first evidence of the disease is a large effusion of fluid into the tunica vaginalis.

Tubercle of the testis in the infant has to be diagnosed from syphilitic disease, which usually appears within the first few weeks of life, and is associated with other evidence of the inherited taint. The syphilitic lesion is usually bilateral; the testes are uniformly enlarged, globular, and painless. The tunica vaginalis may be thickened and the seat of hydrocele, but there are no inflammatory symptoms. As a rule, the testis undergoes atrophy, unless specific treatment is employed early. Among the other conditions of the testis from which tuberculosis has to be diagnosed, are malignant disease and inflamed epiplocele.

The importance of medical and hygienic measures, including open-air treatment, is emphasised. Opinion is divided regarding the necessity for radical operative measures when medicinal treatment fails. Some advocate partial removal of the epididymis or testis, by scissors or sharp spoon, and the injection of iodine or iodoform, with a view to conserving at least some part of the testis, and so retaining its internal secretion. Others recommend complete excision of the gland, provided it is the primary and only focus of disease present.

HÆMOSTASIS IN HÆMOPHILIA.

In a paper read before the Société de Chirurgie (*Rev. de chir.*, Paris, 1907, April), P. Emile Weil reports his observations on the use of blood serum for the arrest of hæmorrhage in hæmophilics.

With regard to the preventive action of serums, Weil has found that in patients the subjects of accidental hæmophilia, the injection of fresh serum renders the coagulation of the blood normal. In a man, æt. 40, for example, who since the age of 12 had frequently suffered from hæmorrhage, and in whom it became necessary to operate for a perinephric abscess and empyema, a preventive injection of 20 c.c. of antidiphtheritic serum was made into a vein, forty-eight hours before the operation, with the result that the bleeding was not more than normal. In another patient, who had once suffered severe hæmorrhage for ten days after the extraction of a tooth, it became necessary to extract one of the molars, and this was done without excessive bleeding, twenty-five days after he had had an intravenous injection of 15 c.c. of ox serum. In cases of congenital hæmophilia, the injection of serum seems to diminish the amount of bleeding, although it does not entirely prevent an excessive loss of blood.

As regards the curative action of serum, Weil has not had the opportunity of trying it in cases of accidental hæmophilia, but in congenital cases he has shown—(1) That injections of blood serum appear to act in the direction of diminishing the tendency to bleeding; (2) that, in addition to this general action, there is a local hæmostatic action. To prevent hæmorrhage in an adult, 10 to 20 c.c. of fresh serum is injected into the veins, or 20 to 30 c.c. under the skin. A second dose may be given two days later. In children half the dose is sufficient. There does not appear to be any difference in the efficiency of human serum, the serum of the rabbit, the horse, or the ox; whichever is used it must be fresh to give the best therapeutic results.

Toussaint has found anti-tetanic and anti-diphtheritic sera equally efficacious in the prevention of bleeding in cases of hæmophilia. Broca was successful in arresting hæmorrhage from the socket of a milk tooth in a hæmophylic boy by plugging the cavity with gauze soaked in anti-diphtheritic serum, and injecting 20 c.c. of the serum under the skin.

A Case of Complete Dislocation of the Fourth Cervical Vertebra followed by Recovery.

Riedl (*Wien. klin. Wchnschr.*, 1907, No. 2) records an interesting case of recovery following complete dislocation in the cervical region at the level of the fourth cervical vertebra, an injury usually followed by irreparable injury to the spinal cord and death. The patient, a woman, æt. 45, fell backwards from a height of 7 ft., landing on the shoulders and back of the head. For a day she was completely paralysed below the neck. Next day she recovered slight power of movement in the legs. The arms remained completely paralysed for four months, but thereafter gradual improvement set in. Five months after the accident she came under Riedl's observation, still bedridden, with spastic paresis in the legs and arms, and pains in the neck, arms, etc. A marked depression was felt above the fifth cervical spine, which with the sixth and seventh could be easily felt. An X-ray photograph showed clearly a complete forward dislocation of the fourth cervical vertebra with the upper three vertebræ in line with it. Antero-posterior views showed no lateral displacement.

Although gradual improvement continued, an effort was made six months after the accident to hasten matters by reducing the dislocation. This was attempted first by applying extension under anæsthesia, and then by exposing the cervical spine from the left side and combining direct manipulation with extension. Neither manœuvre had the least effect in altering the positions of the bones. Four months later, at the time of the report, the patient was able to walk without support, the hand and arm movements were very much improved, and no sensory disturbances were present. The case is of interest as showing that such a lesion is not necessarily fatal. A similar case was published by Steinmann in *Langenbeck's Archiv*, Bd. lxxviii., along with nineteen cases in which death resulted.

THE TREATMENT OF VARICOSE VEINS BY INDUCING THROMBOSIS.

TANEL (*Berl. klin. Wchnschr.*, 1907, No. 7) reports favourable results in twenty-seven cases of varicose veins treated by ligaturing the internal saphenous vein, and subsequently inducing thrombosis in the dilated veins below the ligature by injections of 1 : 20 carbolic solution. He attributes the failures observed after ligature alone to incomplete thrombosis in the veins with subsequent dilatation and occasional restoration of the lumen of the main internal saphenous trunk. His method of operating is as follows :—The varicose veins are marked as accurately on the skin as possible with fuchsine. The main trunk is ligatured above the varices, and on the first or second day thereafter injections of 1 : 20 carbolic lotion are made into the dilated veins below. These injections are repeated every few days till the whole system of dilated veins has been dealt with. Ten c.c. of the lotion are regarded as a maximum dose for one sitting. The action of the carbolic is to irritate the intima of the vein, and so induce a thrombus, and Tanel holds that his injection is less likely to give rise to danger than the use of such drug as perchloride of iron, which coagulates the blood directly. As a matter of fact, no signs of embolism have ever been seen in his cases, the preliminary ligature of the main trunk and the use of carbolic apparently rendering the procedure quite safe. His patients rest in bed for a day or two after the injections, but are allowed to go about freely a few days after the last one has been made, and it is evident that all the varicose veins have become thrombosed. Twenty-six of his cases made good recoveries, and remained well after the treatment ; one patient suffered from a relapse, attributed to the fact that she became pregnant during treatment.

OBSTETRICS AND GYNÆCOLOGY.

UNDER THE CHARGE OF

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THE INFLUENCE OF DISINFECTION OF THE VAGINA ON PUERPERAL MORBIDITY.

BAISCH (*Arch. f. Gynäk.*, Berlin, Bd. lxxxix. S. 325) concludes from a series of examinations made during 1902–1903 on 1000 patients delivered at home, that vaginal douches do not destroy the germs causing puerperal fever. Corrosive sublimate injections were given at the beginning of labour in 500 cases, and omitted in other 500. Of the former, 12·8 per cent. had pyrexia ; of the latter, 8 per cent. General disturbances occurred nearly twice as often in women who had been douched as in those who had not.

AN EXTREMELY CONTRACTED RICKETY PELVIS.

BUCURA (*Monatschr. f. Geburtsh. u. Gynäk.*, Berlin, Bd. xxxiv.) describes with illustrations an extremely contracted pelvis in a woman, 42 cms. high, the conjugate diameter measuring only 2 cms. The iliac crests were acutely curved at each side, the promontory projected to a marked degree, and the sacrum was almost horizontal. This was the most contracted pelvis observed in 50,000 women in the Vienna klinik, and was probably of the pseudo-osteomalacic type.

DECAPSULATION OF THE KIDNEY IN PUERPERAL ECLAMPSIA.

POLANO (*Centralbl. f Gynäk.*, Leipzig, 1907, No. 1) performed decapsulation of both kidneys on a primipara, æt. 38, who had severe eclamptic convulsions thirteen hours after delivery. The operation lasted three-quarters of an hour, and although followed by some temporary improvement, the patient died on the following day. Post-mortem examination revealed acute parenchymatous nephritis.

TUBAL PREGNANCY.

CZYZEWICZ (*Centralbl. f. Gynäk.*, Leipzig, 1906, No. 50) reports an unusual case. Patient, æt. 21, had not menstruated for nine months, when uterine hæmorrhage occurred suddenly and continued for three weeks. A sac lying close to the right side of the uterus was removed by abdominal section, and was found to contain a partially macerated fœtus corresponding to the ninth month. The sac had formed in the middle part of the tube close to the isthmus. Patient recovered.

GAUZE REMOVED FROM THE BLADDER AFTER LAPAROTOMY.

STOECKEL (*Centralbl. f. Gynäk.*, Leipzig, 1907, No. 1) reports the case of a patient, æt. 24, from whom some months previously both ovaries had been removed for gonorrhœal adnexal disease. A fistula had persisted in the abdominal scar, and by means of the cystoscope a foreign body could be seen in the bladder. On removal through the urethra this body was found to be a strip of gauze 21 cms. long. It has caused no cystitis.

TOTAL PROLAPSE OF THE UTERUS AND VAGINAL HYSTERECTOMY.

KIRCHGESSNER (*Ztschr. f. Geburtsh. u. Gynäk.*, Stuttgart, Bd. lviii. Heft 2) states that in combination with plastic vaginal operations, vaginal hysterectomy has been performed on forty patients for complete uterine prolapse during the years 1902–1905. There were three deaths, one attributable to the operation. Thirty-two were kept under observation, of which twenty-six were cured ; in four there were slight recurrence, and two were failures. Most of the patients were between 45 and 65 years of age, and some had been under observation as long as eleven years.

A Contribution to the Prophylaxis and Treatment of Mastitis.

Stiassny (*Gynäk. Rundschau*, Bd. i. Heft 1) writes on the value of Bier's congestive method in the treatment of mastitis. He distinguishes two chief types—(1) Congestive mastitis arising in connection with the onset of lactation, associated with the retention of milk, and characterised by swelling and redness of the breast, pain, and elevation of temperature and pulse. This is the mild type. (2) Mastitis due to lymphatic infection from a fissure causing isolated areas of inflammation in the breast. This is the severe form. Stiassny refers to the older methods of treatment, and describes Bier's method by the application of large glass cups of various sizes, fitted with an exhaust pump, so that the pressure within may be altered to any desired degree. An application of twenty to thirty minutes is generally sufficient; exhaustion should be made for five minutes, and then air let in for another five minutes, or a single continuous application for ten minutes may be made. Details of nine cases belonging to the first type are given. The treatment was uniformly successful, and effected a cure in four to five days. Cases of the second type are then described, in which, if Bier's method is used early enough, spread of inflammation is controlled, and abscess formation prevented. Although there are sometimes failures by this method of treatment, yet in the majority of cases, if used in the earlier stages of inflammation, the severer course of the disease may be prevented.

Twin Ectopic Pregnancy.

Child (*Am. Journ. Obst.*, N.Y., 1907, January) publishes the following case of this condition:—P., æt. 35, had borne six children, the last four years before this abnormal pregnancy. There had been no abortions. Menstruation was regular but scanty. There was a history of irregular hæmorrhages, followed by severe pain in the hypogastrium, lasting for some days. The operation of curetting was carried out, but without benefit; and as symptoms of acute internal hæmorrhage became manifest, the abdomen was opened. The peritoneal cavity was filled with blood. The left Fallopian tube was found ruptured in two places. A fœtus was discovered attached by the umbilical cord to the distal end of the tube, and another lay free on the outer part of the broad ligament. Both ovaries were normal. The patient died twelve hours after operation.

Quinine and Labour Pains.

Mauerer (*Deutsche med. Wchnschr.*, Leipzig, 1907, January) has used quinine in seventy-six cases, of which sixty-three were labours and thirteen abortions. In 78 per cent. a definite action of quinine was observed. The preparation of quinine used makes no difference to the effect. Mauerer gives it by the mouth in preference to subcutaneous injection, as the latter proved to be often painful and inconvenient. Fifteen grs. of the sulphate is given by the mouth to begin with; if no result follows, 0·5 grm. is given in another hour, followed if necessary in half an hour by ½ grm. In no case should more than 3 grms. be given in twenty-four hours. In most cases uterine action becomes manifest in about half an hour. Of fifty cases in which it was given to increase the pains, forty-four were vertex, four breech and two shoulder cases. The quinine acted well in forty-two of the cases. The results in inevitable abortion were satisfactory in ten out of fourteen cases. The author does not think quinine tends to produce atonic paralysis of the uterine muscle, favouring the occurrence of post-partum hæmorrhage, and it does not in any way injuriously influence the child.

THERAPEUTICS.

UNDER THE CHARGE OF

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Bromural.

Runck describes the action of bromural, a new hypnotic drug. Chemically, it is the α-bromisovalerianate of urea. A series of preliminary experiments on healthy men showed that the drug could be administered in doses up to 2 drms. without producing any disagreeable symptoms. In mild cases of sleeplessness, depending on trivial causes, the drug induced sleep when given in 5 to 10-gr. doses. The sleep seemed natural and lasted for several hours, the patients waking without headache or other unpleasant after-effects. When the sleeplessness was due to more serious cause, the drug took longer to act, and the resulting sleep lasted only from three to five hours. It was quite immaterial whether 5 grs. or 25 grs. were administered. The effect seemed to be the same, and the larger doses induced no prolongation of action. The drug seems to possess no narcotic action. It is rapidly excreted, but a second dose given when the patient wakes up produces a second period of sleep which lasts as long as the first sleep. In the presence of severe pain the drug has no power of inducing sleep, but even under these conditions no unpleasant after-effect was noted. A number of experiments on children and infants showed that the drug produced no disturbance of digestion, even when its use was continued over a period of weeks. In a number of instances of milder forms of epilepsy the use of the drug was followed by marked amelioration of the disease.—*München. med. Wchnschr.*, 1907, No. 15.

The Treatment of Severe Cases of Anæmia with Transfusion of Blood.

Morowitz reports a series of six cases which indicate that this old-fashioned method of treating such cases is of distinct benefit. No benefit can be expected from this or any other form of treatment in cases where there is complete aplasia of the bone-marrow or destruction of it from tumours, or in those instances where the destruction of blood cells is so great that a full functioning of the bone-marrow is unable to compensate for the constant destruction of corpuscles. But if these cases are eliminated, there still remains a large category of cases in which the anaemia depends—in part at least—upon a deficient regenerative activity of the bone-marrow, although it is quite capable of making up the deficiency in the blood under the influence of a sufficient stimulus. In certain cases a prolonged course of arsenic is sufficient to cause this stimulus, but in other cases it fails to do so, and in some of these cases transfusion of blood acts as a more efficient stimulus, and induces a better functioning of the marrow. It has been stated that transfusion of blood is a dangerous proceeding, on account of the risk of inducing capillary thromboses; but recent researches show that this is only likely to happen if the defibrinated blood is used immediately while it is still warm. It has been stated that the use of defibrinated blood is dangerous, owing to the so-called ferment intoxication, leading to the formation of intravascular coagulation. But more recent research has shown that this danger is theoretical. The fibrin ferment rapidly disappears from freshly drawn blood, and further, it is readily absorbed by the blood coagula, so that if the precautions are taken of allowing the blood to stand for some time, and if the clots are not pressed, there is no danger of ferment intoxication arising from the use of defibrinated blood. The other symptoms which follow the transfusion, such as œdema, rigors, and hæmoglobinuria, do not depend upon the richness of the blood in fibrin ferment. Though extremely unpleasant to experience, these latter symptoms need not cause much anxiety, as there is no instance on record of their having been followed by a fatal result. There seems even some reason for holding that in these cases, where a severe reaction occurs, the therapeutic effect obtained is rather better than in the cases where no reaction follows the transfusion. In none of the author's cases did an immediate improvement manifest itself after the transfusion. In all the cases a period of three or four days elapsed before the blood began to improve. In two out of six cases the immediate result of the transfusion consisted of a somewhat severe reaction, with œdema, rigors, and hæmoglobinuria. The fact that the therapeutic effect takes some time to develop shows that the good result is not due simply to the introduction of living corpuscles, but depends upon a stimulant action of the marrow. The procedure the author recommends is the following. The blood to be used should be obtained from a healthy individual by a needle inserted into the *vena mediana*. The blood flows into a sterilised glass flask of 500 c.c. capacity. During and after the completed venesection the blood is shaken up with sterile glass pellets (for at least five to ten minutes after the venesection is completed). It is allowed to stand for twenty to thirty minutes, and is then filtered, without any pressure being exerted, through several layers of sterile canvas. As a rule, about 250 c.c. of blood are drawn off, which gives roughly 200 c.c. available for transfusion. The transfusion is made into one of the veins of the bend of the elbow. The vein is exposed by a small incision, and a small cannula is inserted which is connected to a filter by indiarubber tubing. The warmed defibrinated blood is then allowed to flow slowly in, so that about twenty or thirty minutes are taken up by the actual transfusion. The whole process takes about one hour to carry out.—*München. med. Wchnschr.*, 1907, No. 16.

IONTOPHORESIS.

IT is possible to cause substances to penetrate through the intact human skin by utilising certain properties of ions. By passing a galvanic current through a solution of an ionisable compound, the ions are propelled towards the positive and negative poles. The anions are propelled to the anode and the cathions to the cathode, and the amount of ions so affected is proportionate to the strength of the galvanic current employed, and to the length of time during which it is permitted to act. This holds true also for electrodes, which are moistened with solutions of ionisable substances. It is immaterial what substance is used to make the solution—glycerine, water, and alcohol may all be used. The ions pass through the skin in the same direction as they are attached to the electrodes. In every case it is only the ions that pass the epidermis, and not the intact solutions. At the anode the cathions pass out and at the cathode the anions. By employing a suitable galvanic current the ions of all electrolisable substances can be made to pass through the skin. This conception of iontophoresis differs from the old notion of cataphoresis. Iontophoresis presupposes that the substances are split up into the constituent ions which pass through the skin as ions, whereas cataphoresis presupposes that the intact solutions pass through the skin in an unchanged condition without undergoing electrical dissociation. Therapeutically, iontophoresis may be employed in many ways. From the anode, solutions of all true acids exert a similar action upon the skin. The hydrogen-ions pass out and exert a very active chemical effect, which, with a weak current, induces a very active irritant action, while a stronger current causes it to destroy the tissues. The iontophetic method enables us to control the degree and extent of this action. A typical example of this hydrogen-ion action is seen when electro-puncture is carried out with a needle made from one of the noble metals and connected with the anode. In addition to weak acid solutions, metallic solutions can be used at the anode. Though the solution of all the salts and hydrates of a metal produce a similar action, the salts of the different metals differ in the effect upon the skin, depending upon the chemical properties of the various metal ions in question. As a rule, the metals in solution exert under iontophoresis a powerful action, and may even be used as potential cauteries. Certain of the heavy metals, *e.g.* copper and nickel, lead to mummification rather than destruction of the tissues. Further, by iontophoresis the astringent action of certain ions or the antiseptic action, *e.g.* of zinc, silver, and mercury, can be obtained. It is also possible to induce the general action of iron and mercury by iontophoresis. Such a general action is seen when using certain organic cathions, and a rabbit can be instantaneously killed by the iontophoresis of a strychnine solution. It is also easy to obtain the general action of morphine salts by this method, or the local action of quinine, cocaine, and eucaine as antiseptics and the vaso-constricting action of adrenalin. By the cathode, alkalies can be administered. The action depends upon the production of the hydroxyl-ion. Similarly, the action of inorganic acid radicles can be obtained. In using organic anions some caution is necessary, as the passage, *e.g.* of the cyanide-ion, will kill rabbits if applied in weak solutions at the cathode. However, a large number of organic anions are utilisable, *e.g.*, the salicyl-ion and allied substances can be used both for their local and general actions. Similarly, the ions of ichthyol and chrysophanic acid can be utilised. In general terms, iontophoresis is indicated therapeutically as a measure which enables us to cause certain drug ions to exert a penetrating influence upon the skin, and if necessary also to exert their general action after such penetration. The great advantage of the method is that it enables us to control and regulate the degree and length of such penetration. In skin conditions it enables us to produce a caustic effect or the astringent and disinfecting effect, *e.g.* of mercury and ichthyol, or the specific action of aluminium, silver, or salicylates. Further, the iontophetic method permits us to render the skin anæmic with cocaine or adrenalin or to anæsthetise the skin or organs lying immediately under the skin with eucaine, cocaine, antipyrin, etc. Thus iontophoresis is useful in goitre and in superficial neuralgias. The technique is in itself very simple. All that is required is a good galvanic apparatus and pure drugs. A suitable electrode is formed of tin, which adapts itself readily to the skin. The tin must never come into actual contact with the skin, but must always be covered with pure cotton-wool or filter paper moistened with the solution. For cauterising purposes a solution of an alkali or acid may be used of the strength of 4 per mille. If it is intended to cause the ions to penetrate without setting up a caustic effect, certain precautions are necessary to prevent the caustic action of the products of electrolysis, *e.g.*, HCl at the anode and NaOH at the cathode. In this case the active electrode must be covered with a sufficient thickness of cotton-wool or filter paper to prevent these secondary products reaching the skin. By inserting litmus paper between the layers of the filter paper, the progress of the secondary products can be readily controlled.—Frankenhaüser, *Ztschr. f. diätet. u. physikal. Therap.*, Leipzig, 1907, April.

MEDICAL JURISPRUDENCE.

UNDER THE CHARGE OF
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The Pathological Appearances produced in Poisoning by Benzine.

Reuter (*Wien. med. Wchnschr.*, 1907, Nos. 9 and 10) describes two instances of fatal benzine poisoning, which he states must be a very rare poison, as he has only been able to find six previous cases recorded in literature. In one of his cases he was able to carry out a microscopic examination of the organs, and as no such investigation has hitherto been published, his paper is of considerable importance and interest.

The first case was that of a 2-year old child, which accidentally swallowed an ounce of petroleum benzine. It at first cried loudly in consequence of the irritation produced in the mouth and throat, then became somnolent, and when seen by a doctor lay in this condition, with pale face, dilated, reactionless pupils, cyanosed lips, small pulse, and shallow breathing. It died four hours after taking the poison.

The second case was also one of a child, æt. 15 months, which drank a considerable quantity of benzine used by the mother for cleansing purposes. Unconsciousness came on at once, with violent vomiting and purging of matter containing blood. Notwithstanding early treatment, the vomiting continued, and death occurred in two hours.

The post-mortem appearances in both cases were very similar, and Reuter's conclusions are that the characteristic pathological changes produced by benzine are as follows: Hyperæmia of the meninges and brain, subpleural hæmorrhages, lobular hæmorrhagic areas in the lungs, especially in the lower lobes, acute inflammatory changes in the stomach and intestines, which have frequently a hæmorrhagic character. The latter appearances are due to a local irritant effect, while the hyperæmia of the brain arises from a vaso-paralytic action from the absorbed poison. No changes in the blood, heart muscle, or liver were found which could be attributed to a toxic action. The kidneys alone showed a marked parenchymatous degeneration, which evidently arose from the partial elimination of the poison through these organs.

A Case of Suicide by Strangulation.

Although many used in former times to deny the possibility of autostrangulation by means of a ligature, yet it is now generally recognised that this view was mistaken, and many undoubted cases have been recorded. They are, however, sufficiently rare to justify Dufour in publishing the present case (*Rev. de méd. légale*, Paris, 1907, March), which presents some points of special interest.

A girl, æt. 15 years, living with her mother, had several disputes with the latter on the subject of a marriage project, to which the mother was opposed. In consequence of this the girl spoke to her fellow-workers about suicide, and said, "Some day you will hear about me." One morning she tried to throw herself over the window four storeys high, but was caught and locked into her room. At midday, on going into the room, she was found lying motionless on her back in bed with a handkerchief tied round her neck. This was at once removed, and efforts made to resuscitate her, but without success. A doctor who was called in stated that the face was swollen, cyanosed, with marked protrusion of the eyeballs and numerous ecchymoses in the conjunctivæ. A little blood was escaping from both ears. On the neck there was a scarcely visible depression and pallor of the skin where the ligature had been. The body presented no marks of violence. At the post-mortem examination, the appearances above described were seen, and internally the veins of the face and membranes of the brain were found intensely engorged with blood. The lungs were not congested, nor did they show any ecchymoses. There were no extravasations of blood in the tissues of the neck, and the cartilages of the larynx were intact. Both tympanic membranes were found to be ruptured. The ligature employed was found to consist of two handkerchiefs fastened together, and the deceased had apparently effected her purpose by passing this round her neck and tying a double knot.

Ruptures of the Stomach, especially those of an Internal and Incomplete Nature.

In the stomach of a man who died as a result of opium poisoning, Strassmann (*Vrtljschr. f. gerichtl. Med.*, Berlin, 1907 (Suppl.), Bd. xxxiii.) found over half a pint of fluid blood, and the stomach wall in the region of the smaller curvature as well as the lower end of the œsophagus thickened from blood effused into it. The source of this effusion was found to be about a dozen lacerations of the mucous membrane of the stomach, which radiated from the lower end of the œsophagus, and which gaped to the extent of a fifth of an inch. The external serous covering of the viscus showed no indication of injury. The explanation of the condition, Strassmann suggests, is to be found in the distension of the stomach caused during the process of washing it out in the hospital to which the deceased was removed for treatment. That this conclusion is correct is rendered all the more probable, from the fact that Key-Aberg has described exactly the same appearance in a case of poisoning with opium, in connection with which he instituted experiments to prove that distension of the stomach with water or air produced injuries of a similar nature and in the same situation. Key-Aberg is of opinion that probably there may be a special predisposition to such injuries occurring in the case of washing out the stomach in opium poisoning, owing to the insensibility of the patients, and possibly also the diminished reflex excitability and paresis of the muscular coat.

Strassmann mentions another case in which complete rupture of the stomach occurred as a result of too energetic washing out of the organ, but in this instance the patient was suffering from gastric cancer.

The author discusses incomplete ruptures of the stomach walls resulting from external violence, and describes several cases. He also considers the question of the possible origin of chronic ulceration and of cancer from such injuries—a novel point of very considerable interest in connection with possible claims for compensation under the Employers' Liability Act.

Post-Mortem Diffusion of Poisons and their Detection in Exhumed Bodies.

In a paper on the above subject read by Kratter before the German Medico-Legal Society, he records (*Vrtljschr. f. gerichtl. Med.*, Berlin, 1907 (Suppl.), Bd. xxxiii.) several interesting cases in which, after burial for considerable periods, arsenic and strychnine were detected in the bodies. In some instances only small traces of arsenic were found in the remains of the body itself, but it was detected in the floor of the coffin and the earth lying underneath it, although arsenic was not present in the earth of the grave as a whole. In one case he detected the presence of copper and iron in addition to arsenic, the former being due to a copper ornament of the coffin, while the iron had been imbibed from the surrounding earth.

In a case of strychnine poisoning, the body was exhumed six years after burial, and was found to have been almost wholly transformed into adipocere. Strychnine was found in all parts of the body examined, and its presence proved by experiment upon animals as well as by its chemical reactions.

Kratter is of opinion that the transformation of the tissues into adipocere prevents the diffusion of the poison from the body remains, a fact which appears to be corroborated by Ipsen's cases, in which, after several years, he was able to detect the presence of atropine.

The author's conclusions may be stated as follows: All organic and inorganic poisons which resist putrefactive action and chemical decomposition in a body diffuse to the most dependent parts; the readily diffusible vegetable poisons more rapidly than the less mobile mineral substances. The post-mortem diffusibility depends upon the nature of the combination formed by the poison, and upon the progress of the putrefactive process. In exhumations carried out after burial for a considerable time, the most important materials to remove for chemical analysis are the most dependent remains of the body, together with the clothing, shroud, coffin floor, and earth in the immediate proximity of these dependent parts. The success of the search for poisons in such bodies will depend upon attention to the above facts, and under most circumstances the detection of the poison will be possible so long as any remains of a body exist. It must finally be borne in mind that just as there is a diffusion of poisons from the body, so there may also be an imbibition of substances from the surroundings of the corpse.

DISEASES OF THE EYE.

UNDER THE CHARGE OF
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OPHTHALMIC SURGEON, EDINBURGH ROYAL INFIRMARY.

Transplantation of the Cornea.

Were it but possible to remove the densely opaque tissue which covers the site of a destructive ulcer of the cornea, and in its place to lay down clear transparent cornea which would remain in that state, several of the most injurious and destructive diseases of the eye would have few terrors for us. Attempts along this line have been made times and again, but with only indifferent success at the best. Zirm published a case some time ago in which he obtained a result very much better than the usual after a lime burn of the cornea, but he was exceptionally fortunate. Captain O'Meara, I.M.S., now writes describing the method which he has adopted, and which has given him at least some little encouragement. First of all, of course, he attends to the cornea of the patient; under cocaine he transfixes the corneal nebula superficially with a Graefe knife, cuts out upwards, and then, turning the upper edge of the flap downwards by means of forceps, cuts it off. Then he removes a deeper slice in the same way, and so on till now the opaque area is so much thinned away that vision begins to improve, and what of the cornea in that situation remains behind is fairly transparent. Should aqueous humour drain away in the course of the operation, procedure is at once stopped, and four or more days are allowed to pass away before any further step is taken. Old adhesions of the iris in the scar, though not actually prohibitive, are a serious complication. A pariah dog is now put under chloroform, and two or more stitches (of fine silk) are passed through the cornea at equal distances round the margin. The entire cornea is now cut off with a Graefe knife, not with scissors, from its sclerotic attachments, and placed directly in position on the patient's eye; it is there stitched by means of the threads already prepared. A firm bandage is applied for a few days. The central portion generally takes, while the peripheral parts, which are redundant (for the dog's cornea is usually too large), slough away, and the patient's vision may rise from *nil* (O'Meara never performs the operation if the patient has any vision to lose) to counting fingers. At the same time the appearance of the eye is greatly improved.—*Indian Med. Gaz.*, Calcutta, 1907, March.

The Value of Systematic Exercises in Cases of Defective Vision.

The author of the paper dealing with this matter (Heller, Vienna) is convinced that more could be "made" of even very small degrees of vision if a determined and persistent effort were made. He thinks that both the patient and his advisers or educators are apt to regard the intelligence as out of reach by way of sight when sight is reduced to a very low degree, whereas this is not so, and provided even perception of light and dark exists, this may be converted into a valuable channel of communication between the "blind" person's mind and the outer world. In the case of a girl of 14 he was able to test his theories and apply his methods. Her vision was only finger-counting at 1 metre, the fields of vision were small, and there was nystagmus. At first he had little success to encourage him, but by the simple and ingenious plan of keeping the room in darkness except the area of the patient's field of vision, he was able to obtain better results. The function of the eye became better exercised, and the patient could recognise simple figures, squares, circles, cubes, spheres, etc., and localise them. Later he advanced to daylight exercises, it being again necessary at first to use objects in very strong contrast to their surroundings, such as white objects on a black background. In working on this line, care was taken to alter at times not merely the form but the size of the picture or object, and later actually its colour. The patient gradually acquired the art of forming mental visual images of articles and arrangements of articles and lines. When this was attained, she was encouraged to form a mental picture of some known object (not shown), then to alter it mentally, and then to search for it in its amended form among several objects exhibited to her. In this exercise she gained two material points, for she came to understand the relation of a picture to a real object, and combining and "undoing" geometrical figures mentally and objectively, she gradually acquired the ability to read and construct letters. A later exercise was to make her follow certain movements, such as lifting a spoon out of a cup, then reversing the action; she thus learned to unite in drawing points and lines, and so to some extent became able to write and draw. Heller has thus again illustrated how much may be done where a basis of intelligence exists and some vision, even if very rudimentary, to educate and bring out latent powers.—*Ophth. Klin.*, Stuttgart, Bd. x. S. 20.

Retinal Changes in Diabetic Coma.

The patient whose interesting and unusual case is recorded by Heine (Breslau), in the development of which many points of importance both in ophthalmology proper and in medicine suggested themselves, was a lad æt. 17. When first seen by Heine in April 1904, his general condition was very bad, and his urine contained 6·7 per cent. of sugar, besides acetone and acetic acid. Under treatment, he improved for a time and put on a little flesh, but in November of the same year his state of health generally and his urine in particular were very much worse. The abdominal pains, which afterwards formed an important feature of the case, were first complained of at that time. He improved again a little but not very much, and in the following November (1905) the peculiar appearances in the fundus, to be described presently, were observed. About this time the abdominal pains returned, and were very severe. On 5th November a curious sign was present, the intra-ocular tension, namely, had gone down to − 1 or even − 2; well-marked diabetic coma came on, and on the same day he died. Up till a week before his death he had been taking alkali constantly, but had then ceased to do so; two days before death, the urine contained sugar, acetone, acetic acid, and oxy-butyric acid; "coma-cylinders" were found in numbers. At that time the cheeks had a "blae" look, and the skin both of face and body was greasy. Although for some hours before death the intra-ocular tension was so low the pupil reaction never failed, and at no time did the patient complain of any defect of sight. The Riva Rocci apparatus for measuring the pulse tension gave it as 108 to 115. The blood, a specimen of which was taken for examination eight hours before death, showed a specific gravity of 1024; it contained fat to the amount of 8·65 per cent., of which the melting-point was 37° or 38° C. The specimen, on being centrifuged, gave an almost snow-white deposit of a creamy consistency.

The diagnosis was plain enough: diabetic coma, ushered in by colicky pains, alteration in the respiration cycle and quick pulse, and "coma-cylinders" in the urine; the intra-ocular tension going below normal; cerebral symptoms gradually but quickly following.

With the ophthalmoscope the chief point to be noted was the strange colour of the retinal vessels, which looked as though they contained not blood but milk. But along with this there was no alteration in colour of the fundus generally, nor any opacity of the retina itself. In the case of the larger vessels the arteries could be distinguished from the veins, being pale reddish, while these latter were more of a purplish or violet tint; both sets had more of the flat or ribbon-like aspect, perhaps because of their colour, than of the cylindrical. In regard to this matter, an important question presents itself: What is the cause of the peculiar appearance? Blood drawn from the patient has no white tint; it is of a chocolate colour rather; why then does the blood in the retinal vessels appear white? Uhthoff suggests as a possible explanation that the fat particles, being light, are driven to the periphery of the blood stream, and thus impart a white colour to the visible column of blood, for the heavier red corpuscles remain in midstream. It is more than strange, however, that the choroid, which consists very largely of blood vessels, should show no alteration in appearance.

The reduction in intra-ocular tension cannot be due to mere loss of fluid, because it is not present in other diseases in which fluids are drained out of the tissues; nor will lowering of the blood pressure explain it by itself, for a similar reason. Most probably the explanation of its occurrence is that secretion of fluids by the ciliary body simply ceases.—*Klin. Monatsbl. f. Augenh.*, Stuttgart, 1906, December.

REPORTS OF THE MEDICAL SOCIETIES.

Edinburgh Medico-Chirurgical Society.—*May* 1, 1907.—Dr. George Hunter, Vice-President, in the chair.—Dr. W. T. Ritchie read a paper on "The Differentiation of the Varieties of Extra-systole." The normal stimulus for the cardiac contraction starts in the superior and inferior venæ cavæ, passes to the auricles and then to the ventricles. In extra-systole there is a stimulus starting in the auriculo-ventricular bundle. This bundle may be regarded as consisting of two portions, an auricular and a ventricular, united by an intervening nodal point. An extra-systole is evidence of the heart's response to an abnormal stimulus acting primarily upon the fibres of the auricles, of the auriculo-ventricular bundle, or of the ventricles. Simultaneous graphic records of the jugular pulsations and of the arterial pulse, or of the apex beat, are necessary for the differentiation of the varieties of extra-systole which may be classified as follows—(1) Auricular extra-systole, (2) auriculo-ventricular extra-systole, (3) ventricular extra-systole. The paper was illustrated by lantern slides.—Dr. Byrom Bramwell read a paper "On a hitherto undescribed Muscular Lesion occurring in Sprue." Two cases of typical and advanced sprue had been under his observation. There was extreme muscular atrophy for some time before death. The changes in the muscles consisted in multiplication of the nuclei of the sarcolemma and absorption of the muscle substance. The muscle fibres were reduced to mere lines of multiplied nuclei. There was some thickening of the interstitial connective tissue. The motor nerves were normal. The changes were probably due to some toxic substance in the blood, absorbed from the alimentary canal. Similar changes in the muscles had been observed in a case of extreme progressive muscular atrophy.—Dr. C. B. Ker read a paper on "Intubation of the Larynx in Laryngeal Diphtheria." Intubation has certain advantages over tracheotomy, in that it does not involve a cutting operation and therefore leaves no scar. It, on the other hand, does not give the parts complete rest as tracheotomy does. Since the introduction of antitoxin, greatly improved results have been obtained after intubation, and it is now the operation of election. It may be necessary, however, to do a secondary tracheotomy after intubation. Nasal feeding and the use of vulcanite tubes improve the chances of success. The introduction of the tube requires a considerable amount of dexterity, which can only be gained by practice. The tube is left in for from forty-eight to seventy-two hours; after that time it may be removed, and, as a rule, does not require to be replaced. Extubation is much more difficult to perform. In general practice he would advocate early intubation, and so save in many cases a later tracheotomy. Dr. Ker gave an analysis of seventy cases in which intubation had been performed, with a mortality of 21 per cent. In eighteen tracheotomy cases the mortality was 55 per cent.

May 15, 1907.—Dr. William Craig in the chair.—Dr. Melville Dunlop showed—(1) A case of infantile paralysis in which the abdominal muscles of one side are affected ; (2) a baby with a rickety head, in which craniotabes is unusually well marked ; (3) a child with peculiar scarring on the back, the result of an attack of herpes ; (4) a case of cretinism after treatment by thyroid for fourteen years.—Mr. Stiles showed—(1) A baby after operation for the removal of a large hydronephrotic cyst ; (2) a boy after nephrectomy for advanced tuberculous pyonephrosis ; (3) a child after resection of the ileo-cæcal junction and part of the ascending colon for fæcal fistula following suppurative appendicitis ; (4) two cases of partial resection of the tibia for tuberculous osteomyelitis ; (5) a baby with a large encephalo-cystocele (partial exencephalus) ; (6) a large Meckel's diverticulum removed from a hernial sac.—Dr. J. S. Fowler showed—(1) A child suffering from convulsions due to syphilitic disease of the cortex ; (2) a case of posterior basal (cerebro-spinal) meningitis.—Dr. Drummond showed a case of amaurotic family idiocy.—Dr. J. W. Simpson showed (for Dr. John Thomson)—(1) A case of rickets showing large posterior beads of the ribs ; (2) a child, æt. 2½, with splenomedullary leukæmia ; (3) a case of well-marked rheumatic nodules.—Dr. Scott Carmichael showed a patient after operation for suppurative peritonitis.—Dr. Dingwall Fordyce showed a child, æt. 17 months, suffering from urticaria pipneutosa.

Edinburgh Obstetrical Society.—*May* 8, 1907.—Dr. J. W. Ballantyne, President, in the chair.—Professor Jardine, Glasgow, read a paper on "Epilepsy in Pregnancy and Labour." He illustrated his communication by recording the case of a 3-para, who between 27th February and 2nd March of this year, during and after labour, had no less than 774 fits, epileptic in origin, and then died. There was only a slight trace of albumin in the urine, and that towards the end of the fatal illness. The child lived three days, and had during that time numerous fits. Post-mortem examination revealed nothing of importance. Dr. Jardine discussed the effect of pregnancy on epilepsy, pointing out that as a rule it aggravated the tendency to attacks, although in some few cases an epileptic woman improved during pregnancy. In conclusion, the status epilepticus was contrasted with that of eclampsia, and the differences between the two conditions was pointed out.—Dr. Malcolm Campbell read a paper on "Bilateral Ovarian Dermoid Tumours complicating Pregnancy." The patient was a multipara, æt. 32, and when first seen there was a history of six months' pelvic pain and discomfort, with amenorrhœa for three months. The dermoid tumours were removed on 6th June 1906, and in December 1906 the patient was delivered of a full-term healthy fœtus. Dr. Campbell, in conclusion, discussed the literature of the subject.

Glasgow Medico-Chirurgical Society.—*May* 3, 1907.—Dr. J. Lindsay Steven presiding.—Dr. James Adam showed—(*a*) A patient with chronic œdema of the face. The condition had been in progress for two years, and was associated with disease of the nasal mucous membrane, on which, at the angle of the nose, there was scab formation. These parts were kept clean with hydrogen peroxide, mercurial inunction was adopted over the œdematous area, a rubber bandage applied over all, and with administration of thyroid gland extract the condition gradually cleared up. He considered the condition to be a chronic erysipelatous condition, although no streptococci were found on a careful examination. (*b*) A patient with tuberculous lesions of the inferior turbinal, soft palate, pharynx, larynx, tongue, cervical glands, and metacarpal bones. (*c*) A patient with atrophic rhinitis, who had been treated with the injection of solid paraffin, and showed very marked improvement.—Dr. ARCHIBALD YOUNG showed a patient, æt. 10 years, with subspinous dislocation of the head of the left humerus, resultant on injury at birth. The condition was not believed to be a true congenital dislocation, but due to injury during labour, which had been a forcible one, and other lesions were present at birth. There was no evidence of definite paralysis of muscles, but there was slight actual shortening of the limb. Movement was fair.—Dr. GEO. A. ALLAN read notes on a case of primary cancer of the left bronchus. The symptoms were pain, spasmodic cough, and breathlessness. There were enlarged glands in the cervical and axillary regions, complete paralysis of left vocal cord, myosis and partial ptosis on left side, and local hyperidrosis confined to the *right* side of head and face. The growth was found to be a scirrhous carcinoma springing from and completely blocking the left bronchus. The left recurrent laryngeal nerve was pressed on by the tumour, and was found to be degenerated. There was a secondary growth in the thyroid, and also growths in the pericardium and pleura, and involvement of the mediastinal, cervical, and axillary glands.—Dr. W. B. J. POLLOCK read a short paper on "The Relationship of Myopia to School Work," and pointed out that this condition always had its origin in childhood, and was directly dependent on near work ; also that the condition was a preventible one.

May 10, 1907.—Dr. J. LINDSAY STEVEN, the retiring President, delivered his valedictory address, the subject being "The Evolution of the Medical Curriculum." The present system, known as the five years' course, as at present constituted, he considered a failure. The aim of the promoters, namely, to secure an additional year devoted entirely to clinical study, being a suggestion and not a condition, had never been carried out, and the addition of numerous subjects to the curriculum made it now quite impossible. The remedy for this state of affairs might be sought along either of two lines. A sixth year might be added to the course to give more time for clinical work, but this he did not favour. The other method was to cease making additions to the curriculum and delegate the earlier science subjects to the preliminary examination. The latter appeared to him to be the more reasonable. A spirited discussion followed by several speakers, including Prof. Stockman. He emphasised, from his experience of students, the absolute failure of present school methods in the training of the mind, students being too much "spoonfed." He pleaded for a greater freedom of choice for the students in the conduct of their medical course, so that their power of initiative might be developed. He considered the first year spent in the University on the Science subjects was a method of whipping-in the students and teaching them how to work before they tackled the more serious work of the later years.

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